The Dental Digest.

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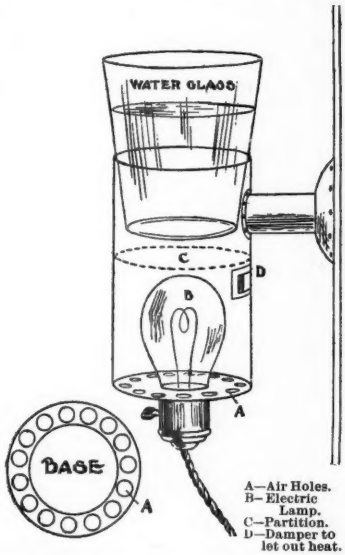
Original Contributions.

DEVICE FOR HEATING WATER.

By W. A. Heckard, D.D.S., Indianapolis, Ind.

Having found a cheap, clean and convenient way of keeping water warm, so that it will always be ready for syringing out cavities, etc., I herewith give a hasty sketch of the method. Take a small brass tube 2½ inches in diameter and 4 inches in length, which can be gotten at any brass goods store, and make a brass base for the same, with a hole in the center large enough to admit a 10 c. p. lamp. A brass tube, small in diameter and of any desired length, should be riveted to the large tube, so that it can be fastened to the wall or bracket. Put a partition in between the lamp and water glass to protect the eyes when getting a syringe full of water.



A—Air Holes.
B—Electric Lamp.
C—Partition.
D—Damper to let out heat.

The lamp makes too much heat, consequently a damper is necessary. Put it in the back or on the side away from the operator, as no one wishes the light to shine in his eyes. The whole can be made very cheaply and does away with much of the present trouble in this line, besides making an ornamental and attractive addition to the office furniture.

HYPODERMATIC TABLETS FOR

Local Anaesthesia,

DENTAL.

Formula of N. L. HOFF, D.D.S.

Our Hypodermatic Tablet No. 81, "Local Anæsthetic (Dental)," is made, as stated above, after the formula of Dr. Hoff, and we beg to quote from his paper upon the subject, published in the *Ohio Dental Journal*, as follows.

"The combination I am now using as a local obtundent yields good results. I use sterilized water to make the solution, and, to prevent possible decomposition, make daily or as needed for use. The formula I use is as follows:

℞ Cocaine.....gr. 1-2
Sulphate of Morphine.....gr. 1-8
Sulphate of Atropine.....gr. 1-200
Sterilized water.....gtts. xxx
Mix and inject hypoder. gtts. v to xv.

"For convenience I have had the Cocaine, Morphine and Atropine made into soluble tablets by Parke, Davis & Co., of Detroit, and in this way solutions of any strength desired may be quickly and accurately made with little or no inconvenience. As a solvent I use distilled water containing from 8 to 10 per cent. Euthymol to keep it sterile. If desired to make a 2-per-cent. solution all that is necessary is to dissolve one tablet in 25 minims of water; a 1-per-cent. solution can be made by dissolving one tablet in twice this quantity of water, or 50 minims. A 4-per-cent. solution can be made either by reducing the water one-half or adding another tablet to the 25 minims, etc."

IN TUBES OF 25, 45 CENTS PER TUBE; OR FOUR TUBES (100 TABLETS), $1.65; OR, IN BOTTLES OF 100 TABLETS, $1.55 PER BOTTLE; BUT THESE TABLETS PARTICULARLY, BEING MADE VERY FRIABLE IN ORDER TO BE QUICKLY SOLUBLE, ARE BEST KEPT IN TUBES OF 25.

Our ***Descriptive Price List of Pharmaceuticals of Especial Interest to Dentists*** will be promptly forwarded upon request. Just drop us a postal card.

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WORK AND RESULTS OF OUR DENTAL COLLEGES.

By H. W. Allwine, D.D.S., Omaha, Neb.

Having prepared specially to make educational work my profession, and having engaged therein a number of years, mostly as superintendent of schools, the work as done in dental colleges naturally attracted my attention while I was a dental student. I was quick to discern what I considered the efficiency or inefficency of members of the faculty, from a pedagogic standpoint. The very meager preparation of many of the students, before beginning study of a profession of so grave responsibility, was also apparent. Noting these conditions and their consequences, the outcome to me seems natural. The results of examinations and methods of practice of many graduates bear evidence that something is wrong.

I have been much interested in articles along this line. Dr. Marshall, in the August DIGEST, gives some excellent advice concerning the work of our dental colleges. I think his remarks are timely and should be weighed by the profession. The causes of the poor results of our dental colleges are twofold. First, the work of the faculty is defective; second, the student has not had proper education and culture previous to entering the college.

As our colleges aim to raise the standard of their requirements by lengthening the terms and increasing the number of years of the course, they should certainly not forget the most important consideration—that of properly educating as well as instructing the pupil. In some of our colleges there is much room for improvement, and even for an entire renovation and revolution. The results of the examinations of graduates and the methods of practice bear evidence. We cannot wonder that many of our states refuse to recognize the diploma of the machine-made graduate.

Pedagogics is a science and an art. The educated man is not always an educator. The preparation of the successful teacher must be triune. He must not only have the *matter*—be a receptacle of the knowledge to be imparted—but he must know the *mind* to be instructed, educated and cultured, as well as he must know the *method* of uniting *mind* and *matter* harmoniously to bring about proper results. An educated and cultured mind will instruct itself. A purely instructed mind is a mere receptacle. Education and instruction go hand in hand. Instruction begins where knowledge ends and the powers cannot be further drawn out. My observations

are such as to justify me in saying that too many of our college men are mere instructors and not educators. They cram the mind with facts, but fail to call out the powers that make man a living soul. They fail to give that much-needed culture, which is the developing power of the mind.

We hear and read of the requirements colleges make of their matriculates. Is it not a fact that in many cases little or no attention is given to the previous training of students? Is it not a fact that many are found whose crania are empty; but, turning the X-ray on the young man, dark round shadows are detected in his pockets? The objects which form these shadows are very necessary to the welfare of any institution. Is he rejected? We see young men who have no practical knowledge of English taking a dental course. Their orthography is very defective. They cannot construct a sentence grammatically and tell why it is so. Of the sciences and literature they know nothing. Mentally they are entirely unfit to begin the study of a profession whose care is the human body, the tabernacle of the soul. The aim of such young men cannot be high, because they are not capable of forming a proper ideal. The aim of colleges that admit such material must be pecuniary.

The lecture system is very faulty. Matter is given too rapidly. No time is given for digestion. Too much is given in a short time; it cannot be made sufficiently impressive. In many cases it is out of reach of the average student, and his only recourse is his defective and unintelligible notes. He gets things mixed, and before having righted them he appears before some state examining board with the "sucking mania," as the editor of the *Items* puts it.

I favor text-books. I believe that the subject matter of each lecture should be carefully studied by the pupil before the lecture hour. His mind is then ready for education along the line of the talk, and in a proper state for instruction; and, as no text-book can cover the subject completely, there is ample opportunity to add new matter and indelibly impress that which he has read. By preparing the subject beforehand, the student is ready to do a large part of the work of the hour and the lecturer knows where instruction is needed. The student is now able to take intelligible notes. The subject is mastered at every step before further progress is made. The instructor becomes thoroughly familiar with the attainments of his pupil and knows at the proper time where to cull. He does not

depend upon the work done at examination to determine the pupil's standing. Such matter may be gotten largely from sources without, and the markings would not represent true standing.

I favor thorough preparation, from a pedagogic standpoint, of the lecturer or instructor. He should have his subject matter well in hand and be cognizant of the needs of his pupils, and not think only of the prestige he hopes to get through his college position in the estimation of the public. Fewer colleges, and well paid professional instructors, will give the public better professional service. An hour now and then given the students from a busy office practice, by the average man, cannot result in systematic presentation of the subject. Matter and method are most likely defective. Colleges that give this subject attention will speed along well in the race.

The importance of the dental profession demands a more thorough groundwork of the students preparatory to entering the colleges. It looks to me as if a backward step was taken by the Faculties' Association at its last meeting. If the object is to turn out merely mechanical men, whose stock of knowledge is narrowly limited to dentistry, and not to send forth men of culture who will grace a profession, then the present course of procedure is the proper one.

CATAPHORESIS.

By Arthur Holbrook, D.D.S., Milwaukee. Read before Wisconsin State Dental Society, July 20–22, 1897.

The success of all dental operations depends primarily upon *thoroughness*. Failures of fillings in living teeth can often be traced to improper or imperfect preparation of cavities, and on the other hand the success in almost hopeless cases of decay in "dead teeth" is due to the simple reason that the tooth could be properly prepared *without pain*. The pain inflicted has been a trial to the dentist as well as the patient, and it is safe to assert that not only the happiness but the health of the conscientious dentist is impaired by the terrible strain upon his strength and nervous forces. So the hearts and the brains of dentists have long sought for a means to allay the suffering of their patients; and it may be added, parenthetically, to the credit of the profession, that the seeking for relief has been upon the part of those who have inflicted the pain and *not* by those who endured it.

In this paper it is not my purpose to present an original idea or achievement, but to deduct truths from a great array of miscellaneous

and often contradictory statements; and by giving the results of a somewhat painstaking personal observation and study to solve for some of you the problems which have arisen with what is perhaps the subject of most vital interest to the dental surgeon to-day—cataphoresis.

Because most dental operations are minor and the prognosis never serious, and because they are prolonged, the common use of a general anesthetic is utterly impracticable. So that with the common use of general anesthesia in surgery, it is a fact that more pain is inflicted upon the people by the dentist than by the surgeon of any other department of the science. For a decade article after article has appeared in dental literature presenting this or that form of local anesthesia, while in the advertising pages one could count scores of drugs and appliances which have been offered to secure truth for the quack who advertises his "Painless Dentistry." And it seems now that with our better understanding of drug action, with the development of histology, chemistry and physics, the time must be near at hand when we can apply our local anesthesia as successfully and commonly as does the general surgeon his ether or chloroform.

Of the methods of securing this result cataphoresis is the latest, and from a conscientious study of the subject and a very uniform success in its application, I sincerely feel that, with all its present imperfections and limitations, cataphoresis is capable of a development which will place it in the category of those discoveries and inventions by which the advance of our profession has been measured.

Although new in its application to dentistry, the use of electricity for the promotion of osmosis is old, and ever since Dr. Richardson expressed the theory in 1858, it has been used in medical and surgical practice to hasten and increase drug absorption. After its marked success in these fields it is not surprising that some of our original thinkers should conceive the idea of using it to facilitate the introduction of drugs into the hard, dense tissues of the teeth.

There are many theories as to the nature of electricity and its effects, and hence there are many theories as to how electricity promotes osmosis. Some students of cataphoresis go so far as to deny that osmosis of the drug into the tooth occurs, and that the anesthesia is accomplished by paralysis resulting from the current. Of this we shall have more to say later, and for our present needs we have but to accept the fully established fact—that molecular dis-

turbance in a solid caused by an electrical current hastens the absorption of some liquids by that solid in the direction of the applied current. To this end we apply an electrical current in such a manner as to pass from the anode, applied to the tooth, through the tooth, through a part of the body to the cathode, which is most conveniently held in the patient's hand. At the point where the current enters the tooth is placed the drug to be absorbed.

Simple as this may seem, with the carefully arranged and simplified apparatus at our disposal, there are nevertheless a variety of elements that enter into the application of cataphoresis, which are of such importance that the failure of a single one may mean the total loss of effect, or may endanger the life of your patient.

I have read articles and accounts of discussions which show clearly that the men giving their experience with cataphoresis have lacked knowledge of the first principles governing its application. That they have bought their outfits and followed the arbitrary rules of the manufacturer's catalogue or agent, and are now disputing the real students of the subject, or revealing their ignorance by worthless magazine articles or a list of failures which they scoffingly present. The dentist must know his apparatus. There are many cataphoric outfits on the market, and many of them are thoroughly reliable. It is certainly unnecessary to follow the advice which has been given, for the dentist to manufacture most of the apparatus for himself, although he may improve many little details in the yet imperfected appliances.

If the instrument is connected to the street current with proper precautions, it is just as safe and reliable, and certainly cheaper and more satisfactory than the maintenance of office batteries. Of course the dentist must guard against the accidental grounding of the wire from the patient's contact with fountain cuspidor or other possibilities, but this insulation of the patient can be easily and perfectly accomplished. With many instruments the use of the street current is an impossibility, and even the stoppage of an electric car is felt by the patient; but with proper resistance before the current reaches the rheostat—and with a reliable rheostat the variation is positively unnoticeable and the current to all practical uses is unvarying—the change of pressure back of the resistance does not perceptibly influence the flow beyond the rheostat. I am able to quiet the fears of my most nervous patients when I explain that the system I use

(from an electric lighting plant) has no overhead wires, and in the almost impossible case of a sudden shock—a crossed wire, a lightning stroke—there are between the outside wire and the patient, on different floors and in different parts of the building, seven separate fuses, any one of which would instantly burn out, as well as numerous lamps, rheostats and other shunts.

Having the instrument connected, it is necessary before application to determine the polarity of the current. How many a failure in the use of cataphoresis has been made by the careless application of the poles, so that the current was running through the body and *out* of the tooth—absolutely preventing the absorption of the fluid. I personally know of cases where dentists have recorded failure because of this fault, and many of these men who have found success in about every fourth application would raise their average by attending to the polarity. In my practice the attendant tests the polarity before each operation by applying the poles to a solution of iodid of potassium and noting the characteristic discoloration at the anode. Although in 100 cases so tested with my present apparatus the polarity has been nearly constant, I have known it to vary almost daily in other instruments; and, although having a reliable milliamperemeter in the current, I believe the various chances for possible alternations of current demand this repeated test of polarity.

The instrument being adjusted and the polarity known, it is now of the greatest importance that we determine the resistance offered to the current by the patient. Of this resistance, that presented by the body aside from the tooth is of comparatively small variation, while the resistance of the tooth itself may vary, as has been estimated, from five thousand to eighty thousand ohms. This is a point upon which I wish to lay particular stress, for many dentists in using cataphoresis attend merely to the *pressure of the current used*, with no knowledge whatever of the amount of flow of that current through the objective tooth. They may know the voltage of their current, and by diminishing a certain number of ohms on their rheostat, apply to their satisfaction a certain current strength, but with absolutely no knowledge of the resistance offered by that tooth, how can they intelligently determine the proper current strength to be used? Gentlemen, let me assure you that the turning on of a certain amount of current, with no reliable knowledge of the resistance offered to that current, is an act of folly, if not of

danger. Personally I should never use a cataphoric outfit without a frequently tested milliamperemeter *to measure the current which flows through the tooth, thus indirectly measuring the resistance offered by the tooth and giving me a perfectly reliable guide as to the amount proper to apply.*

The track traversed by the arm of my rheostat I have divided into tenths for the purpose of noting and recording the minimum pressure to secure a certain flow of current through a tooth—which is shown by comparison with the milliamperemeter. Despite the increase of pressure from behind, a limit of current through the tooth and milliamperemeter is often reached and maintained because of the resistance of the tooth. But it must be remembered a high pressure upon a heavily resisting tooth may be injurious and even dangerous. Twenty volts is considered harmless for anyone to take, and to make the current absolutely safe it ought never to exceed that amount. To secure this safety the current can be easily regulated by lamp resistance so that it will never measure more than twenty volts even before it reaches the rheostat. The current can be easily and positively reduced through shunts by any expert electrician. With such connections and certain knowledge of the amount of current flowing through a tooth, the much discussed dangers from using a "110 volt street current" are not to be feared.

Before leaving the subject of adjustment of the apparatus I wish to urge upon you the necessity of keeping the instrument as completely out of the patient's view as is practicable. The temperaments of our patients must be carefully studied, and while we may have to explain in detail to the electrical genius, to the hysterical woman or the frightened child, the less display the more satisfactory our results, and the possible avoidance of a paroxysm that staggers us with fear of too strong a current or of cocain poisoning.

Thus understanding our apparatus, we must acquaint ourselves thoroughly with the proper methods of preparing the field of operation. We must remember the first axiom of electricity—that the current follows always the lines of least resistance; and hence make our first object the insulation of the tooth. The moisture which collects between the cavity and the gums, and adjacent metallic appliances or proximal fillings, are the commonest causes for a deflection of current from the solid resisting tooth. The external tooth and margins of the cavities must be carefully tried, while all

adjacent metals, whether of fillings or appliances, must be guarded by insulating pads, a layer of wax or equally effective means. Deep-seated cervical and approximal cavities with old fillings, especially in molars, will often be found difficult to isolate.

Our attention should next be given to the drug we employ for the anesthesia. It has been claimed by some that this is of the least importance. It has been said that the usefulness of cataphoresis is limited to its hypnotic power, and that were the element of imagination eliminated, it would be without effect. This so-called psychotherapy, which our faith cures illustrate, is without doubt an element in many cases, but that cataphoresis depends on that little element for its success I am able to dispute point blank. To those who claim that water is as useful an agent to administer as any other I must also protest, for repeated experiments disprove the claim.

Perchance, in addition to the hypnotic element, anesthesia may be aided by more or less paralysis, and although I have never seen such a statement, it seems possible that Schleich's infiltration method may play some part in the deadening of the pain. This latter method, which the surgeon has found so useful in minor operations on soft parts, consists in infiltrating the tissues by hypodermic injections—enormously increasing the tension about the operation field. This has the effect of paralyzing or numbing the sensation of the area, and although accomplished in degree by solution of salt and water, it is far more effective by the use of a local anesthetic in the solution. As this theory has been found practical to the general surgeon, and of late to the oculist, I suggest the possibility of its being an element in dentistry, where solutions are forced with unusual power into the already firm, dense tissue.

Admitting these elements as aids to our anesthesia from the literature on the subject and from personal observations, I submit: *that the successful application of cataphoresis is impossible without the agency of a proper solution of cocain or other local anesthetic.*

At present there is before us no drug to approach cocain in efficacy for cataphoric application. In studying the preparations of cocain I have had considerable correspondence with an expert chemist, whose daily occupation year after year is the testing and superintending of manufacture of the greater part of the cocain used in this country. He says: "Cocain is the most easily decomposed of all alkaloids. Solution in water of the hydrochlorate (its com-

mon form) commences to decompose at once, although the process is very slow at first. If the solution is acid in reaction the decomposition is quicker, and heat hastens the process still more." The addition of antiseptics and germicides prevents the formation of molds, but there is no preventive yet discovered for the chemical decomposition. For us who formerly kept our cocain solutions for months, and had the bottle refilled from the druggist's stock bottle, this may explain some failures of applications. I was recently in the operating-room of a large hospital and was shown a row of bottles for hypodermic use; strychnin, digitalis, nitro-glycerin and others, *all in solution;* but on the end of the row was a bottle marked "cocain," filled with powders and labeled with an injunction to make a fresh solution when used. So whatever preparation we use, it may be kept in powder, tablet or crystal form, and be applied from a fresh solution.

Since acid hastens decomposition we must secure a neutral or weakly alkaline reaction at the field of operation, and must assure ourselves that bottles, mortars, cotton and anything which comes in contact with the cocain are not soiled with acids.

As to the effect of electrical currents upon the stability of cocain there has been much discussion. I have reserved for this connection what I have to say regarding the strength of current employed; for it is not digressing from the subject now under consideration, but concerns it most intimately. There have been claims, and by excellent men, that a current strong enough to induce osmosis into a tooth would decompose cocain; by others that a strong current was necessary for the osmosis, and that the electrolytic effect on the cocain was what was necessary to produce anesthesia; still others assert that the weakest electrical currents cause electrolysis and are not sufficient to cause osmosis. Clinical facts disprove some of these views, and to corroborate the clinical experience and definitely decide the disputed points come the results of experiments under Professor Herdman's direction at Ann Arbor, which are undisputably reliable. The conclusions which he reaches that concern us are, in his own words: "First. That cocain hydrochlorate solution is cataphoric. Second. That with the strength and density of current ordinarily employed in therapeutic applications there seems to be no decomposition of the cocain hydrochlorate at the anode." And he further concludes that although with these *weak currents* the

intact molecule of cocain hydrochlorate may be transmitted into the tooth tissue, with moderately strong currents the molecule is decomposed. So of what value are these reports from dentists who failed in result, although, as they confidently state, "the current was so strong and painful as the patient could bear."

Gentlemen, do not look for anesthesia where your current causes pain, and put no confidence in the results of the operator who, without a milliamperemeter, gauges his current by the sensations of the patient, or the track of his rheostat. The records of any careful observer will show how weak a current may be effectually employed, how in a hard, dry, pipe-clay tooth almost complete anesthesia may be caused by a current strength of one-twentieth of a milliampere—one twenty-thousandth of an ampere.

If you are chemists enough to care for formulæ of the reactions in the decomposition of cocain, I have them; but aside from the fact of decomposition, the chemical reactions are of no particular interest.

As to the best preparation to employ, we must consider its purity, ready solubility and accurate and convenient division for dosage. For the purity we must depend upon a good druggist who provides us with the article from standard firms. The tests for purity are technical and occupy too much time for us. Most preparations of cocain are readily soluble in water—if we use crystals or tablets they lose no virtue in being triturated and dissolve more readily after such process. The alkaloid itself has been recommended, but as it is insoluble in water and must be used in alcoholic solution of one part cocain to three and a half parts alcohol it is generally undesirable, since alcohol is a poor conductor of electricity. However, this solution of the alkaloid is quite stable, and if absorbed acts quicker than the salts of cocain, so I would suggest the possibility of an advantage from its use in deep cut cavities or directly on the pulp, otherwise it possesses no advantage over the hydrochlorate, which is the most popular form in use and deservedly so. The hydrochlorate is best used in tablet form, which gives a convenient, stable, very soluble and accurately measured dose.

In my practice I am using soluble porous discs of the hydrochlorate, and one is soluble in a drop of water. Many of the tablets upon the market contain in combination more or less extraneous matter to give bulk and consistency, which additions often retard the solubility and effectiveness for dental purposes.

As to the dosage employed, there should be no uncertainty or fear where caution is used. Medical authorities give internally from a quarter to one or even two grains; specialists freely spray and swab the throat with a four per cent solution, representing two and a half grains to the drachm; surgeons ordinarily dissolve from a half to one grain in a hypodermic syringe barrel and inject the entire dose if necessary. I have found a report of a susceptible woman who was made faint, nauseated and depressed by about a quarter of a grain in the nasal passages; and on the other hand of a man who swallowed eighteen grains at one dose without an untoward symptom.

Before deciding on the dosage of cocain for us to employ, let us understand that the object of cataphoresis is not always to secure and maintain a complete anesthesia—local anesthesia is rarely complete, and the general surgeon with his readily accessible soft tissue never expects to perform his operation with a complete loss of sensation. What he strives for, and what we must strive for, is an obtunding of the nerve sensibility to such an extent that the operation is borne in comparative comfort.

The minimum dose of cocain that I can find advocated in the best literature is one-eighth of a grain. I can find no authority who would not inject this dose into an adult with impunity, while the commonly employed dose is between a half and one grain. So when I recommend that a tablet or powder containing one-sixth of a grain of the hydrochlorate be triturated and dissolved in a drop or two of water at the time of operation, and this be taken up by a small pledget of cotton and applied to the field, I do so with an absolute certainty that no overdosage will ensue. If every molecule of that cocain were absorbed it could not do the slightest harm, excepting in those extremely rare cases where a remarkable idiosyncracy exists, and never has a case been reported where one-sixth of a grain endangered life. But you can readily appreciate that under the circumstances it would be impossible for the entire dose to be taken. The cotton never absorbs all of the fluid; one-fourth at least is left of the original solution, and on removing the cotton after applying your current there may be squeezed out a considerable part of the dose. At the most exaggerated margin not a third of that sixth of a grain is absorbed, perhaps not a fiftieth. For argument let us say a third is absorbed—a dose of one-eighteenth of a grain, which is not enough to harm our youngest or feeblest patient.

This dosage of one-sixth grain represents one drop of about a sixteen per cent solution. Experience has proven that this dose is ample, and although seemingly too small to be effective, experiments fully show that its omission or substitution by water is without the anesthetic result.

If by any accident we should apply an overdose to our patient, if our assistant is careless, or our measure faulty, or if the patient swallows a quantity, we should look for these symptoms: faintness, giddiness, nausea, pulse small, rapid and intermittent, pupils dilated, severe prostration, respiration slow and feeble. To meet these conditions the patient should be laid flat and the clothing loosened, while we should employ every means of stimulation at our command. Get the patient thoroughly heated, give hot stimulating drinks, and if necessary perform artificial respiration by slowly raising the arms high above the head for inspiration and bringing them slowly forward and down on the chest with considerable pressure for expiration. Some dentists keep on hand the small pearl beads of amyl nitrite to be broken in a handkerchief, from which the prostrated patient inhales. They are very convenient and are highly recommended for cocain poisoning.

We must, however, differentiate between hysteria and cocain poisoning. In hysteria our patients would not have the intermittent pulse, they would be emotional and solicitous instead of prostrated, and their rapid, strong breathing would take the place of the slow, feeble respirations of the cocain sufferer.

The unfortunate element of time in the application of cataphoresis caters to this fear, for the patient, already wrought to a high tension by approaching operation, is made to quietly sit for a quarter of an hour with this strange, mysterious, electrical instrument applied—lightning strokes, crossed street wires, the electrocution chair are brought to mind, and if the patient be at all susceptible he is under most favorable conditions for a nervous paroysm. Until the present system be replaced by one that requires shorter application, we must study to divert our patient's attention and to be always reassuring of their safety.

Many patients are solicitous lest some permanent injury to the teeth follow the electrical application, and this fear is in every way reasonable, since it has occupied the attention of some of our leading thinkers. But the apprehensions of these more conservative men,

that the long use of the current may injure the pulp, are being less and less expressed, since the value of very weak currents has become better understood and the clinical reports of hundreds of carefully applied and carefully observed cases have shown the harmlessness of the current.

Before we enter into a discussion of this subject I desire to briefly summarize the points I feel to be of vital importance to the dentist in successfully applying cataphoresis: First, to understand the fundamental principles of the theory of electrical osmosis. Then to thoroughly know his apparatus; its relations to the current it receives, with especial regard to connection, shunts and resistance, being certain for absolute safety that the current reaching the rheostat never exceeds twenty volts. The rheostat, particularly with reference to the control and steadiness of current. The milliamperemeter, to indirectly measure the resistance of the tooth, and to determine the amount of current. Next, the preparation of the field; its insulation from moisture, fillings, and appliances; its proper neutral or alkaline reaction. Then the reagent used: To properly select a preparation; to use a fresh solution and understand the liability to decomposition and those agents that assist decomposition; to select the proper dosage. Then to appreciate the value of a weak current, since it promotes osmosis and does not decompose the molecule. Finally, to study the temperaments of his patients—after which considerations he should be able to apply cataphoresis in a thoroughly rational and successful manner.

Discussion. Dr. Batchelder: I do not like the hand cathode, because the patient controls the current, and by simply moving his hand he will get more or less shock by breaking the contact. Sloughing of the gums almost always comes from impure cocain.

Dr. J. W. Boisol: I use eucain hydrochlorate instead of cocain, as I find that with a five per cent solution of the former there is no danger from absorption as there is in the latter, and there is risk in using cocain.

Dr. J. J. Wright: I use a direct current, and recently went to the assistant of the Milwaukee system to find out just how much danger I was running. He said there was practically no risk, as a large system, having a large power-house, employed enough operators to keep the current at about the same strength all the time. A small system, however, might vary.

ORAL HYGIENE.

By Eugene S. Talbot, M.D., D.D.S., Chicago. Read before XIIth International Medical Congress at Moscow, Russia, August 18-26, 1897.

That the mouth and teeth should be kept absolutely clean and free from deposits, every practitioner will admit is but an axiomatic statement. Neglect in this direction entails degeneration of the teeth and soft parts of the mouth, which in turn ultimately affects the general health. Many dentists and most patients are unmindful of the necessity of keeping the gums and mucous membrane healthy. Frequently, despite strict injunctions are given, the patient returns with the mouth in the most unhygienic condition. The patient has gradually lost ambition and allowed the teeth and mouth to fall far beneath ideal prophylaxis.

As a profession dentists are apt to congratulate themselves upon the rapid advancement made in the specialty, forgetting that bacteriologic research demonstrates a fact which physicians and dentists have suspected, that the mouth is the culture medium for germs which, when opportunity offers, play their part in producing many diseases which flesh is heir to.

Galippe, Black and Miller, after special microscopic study of fluids and excretions of the mouth, have shown that this organ is a very fruitful field for the propagation of bacteria. Miller says, "Within the last few years I have isolated more than 100 different kinds of bacteria from the juices and deposits in the mouth. Physiologists and chemists have also shown that foods, especially starch and sugar, taken into the mouth, on coming in contact with the saliva, chemical changes immediately take place, as a result of which lactic acid is produced." Miller has found that lactic acid is the source from which decay of the teeth results.

It would be strange if some of the numerous bacteria, under favorable environment, should not produce diseases of the mouth, alimentary canal and general system.

Microorganisms are more destructive in the mouths of persons whose vitality is below par than those who are normal. People who have been ill for any length of time soon realize that the teeth are giving way, that pus germs infect the mouth and that the soft tissues are very unhealthy. A class coming for treatment, whose mouths are exceedingly prone to disease, is that of the degenerates.

It is almost impossible at present for the majority of dentists to distinguish this class from the normal, yet they exist in dental practice in large numbers.

The mouths of this class are in an unhealthy condition; the teeth irregular and often badly decayed, gums and mucous membrane swollen, with pyorrheal oozing from gums and teeth. Frequently ulcers occur at different localities, and saliva flows freely from enlarged glands. Degeneracy is stamped upon their faces. The bones and mucous membrane of the nose are often hypertrophied. In such cases adenoid vegetation, together with other obstructing factors, prevents nose-breathing and mouth-breathing results. Necessarily many germs otherwise absent are taken into the mouth, which afterwards infect the lungs and alimentary canal. These types of mouth are observed in their most exaggerated forms among the imbeciles, dements and stuporous lunatics. Local treatment of such patients would be fallacy.

I lay stress upon this class of cases, because of the lack of literature on the subject and the difficulty of impressing the patient with the importance of the care of the mouth. Such persons, even if otherwise fairly well balanced, are too unstable and have not sufficient continuous will power to carry out successfully instructions of the operator. These patients, including those who are afflicted with disease, require constitutional treatment to restore the tonicity of structure, after which local treatment proves successful.

I would not, however, for one moment be thought to discourage the attempt to keep the mouth in hygienic condition, especially in cases of invalids and small children, who must receive the greatest care from nurse or parent. As absence of general tonicity will prevent a local restoration to health, in like manner will lack of local cleanliness cause systemic disturbances. Besides illness, worry, anxiety, trouble will produce malnutrition and tissue degeneration.

It is not necessary to discuss the various bacteria and their action upon the fluids and tissues of the mouth, since this has been thoroughly brought before the profession by Miller. To treat the subject of this paper in a proper manner it is necessary to speak only of a few forms of bacteria which, if destroyed, the other kinds will succumb.

Two of the most marked forms of degeneration of tissue as the result of uncleanliness are tooth decay and gum inflammation,

resulting in pyorrhea. Pasteur has remarked, "that whenever and wherever there is decomposition of organic matter—whether it be the case of an herb or an oak, of a worm or whale—the work is exclusively done by infinitely small organisms." Therefore I commend the following propositions: If the mouth and teeth were kept absolutely clean, so that chemical changes could not take place, the teeth would certainly never decay, no matter how imperfectly the enamel might develop. If the gums be stimulated in a proper manner, and kept in a healthy condition, they are decidedly less liable to become infected with pyorrhea.

Bearing these two propositions in mind and striving to attain the results, the mouth will become comparatively healthy. How then shall we accomplish the desired object? Use of proper toothbrush, mouth-wash and a knowledge of their use, is the indication. The ordinary toothbrush falls far short of what is required for proper care of the teeth. Most have soft bristles, or else they become soft, for the reason that they are sometimes kept in a closed vessel or used so often that they are not allowed to dry. A soft-bristle brush should never be used, only a medium or hard one. The size of the brush is also to be taken into consideration. Most of them are too large and on that account it is difficult to get beyond the molars. The shape of the brush is also to be borne in mind. Dr. M. L. Rhein, of New York, has taught the evolution of the toothbrush. The curved handle and small end which contain the bristles are certainly a great improvement over straight handles or those bent in the opposite direction from the bristles. The tuft and concavity of the bristles (so far as they go) are an improvement over bristles which are at right angles to the handle. This allows the posterior portion of the molars as well as the spaces between the teeth to be reached when the brush is properly used.

With the proper use of such a brush three times a day, and floss silk twice a day, any person of ordinary intelligence, after being instructed, can keep the teeth clean. There can be no question but that if the gums be well stimulated and an antiseptic wash used, pyorrhea will never appear. Pyorrhea is due either to simple or chronic inflammation of the gums, no matter whether the cause be local or constitutional. Both simple and chronic inflammation may be reduced, first by blood-letting, to relieve the congestion, and second, by stimulation of all the parts. This, however, cannot be

accomplished with the toothbrushes now in use. The bristles are not only too soft, but they are so close together that when the brush is applied to the tooth, those bristles which come in contact with the teeth prevent the others reaching the gums.

I have given this subject considerable study, the result of which is the following brush, which for the past two years I have had my patients use, and with the greatest satisfaction. It is made similar to the prophylactic, only smaller in every way. Spaces are left at every two rows, so that the teeth will pass in between them and the bristles reach the gums. Between the tuft upon the end and the body of the brush quite a space is left, so that the front teeth, upper and lower, will go between and the tuft reach the gums above, below and posterior to the incisor teeth. Inflammation of the gums starts most frequently at these localities first and is usually in its most severe form, since with the ordinary toothbrush it is more difficult to reach these parts.

It is not an easy matter to find a mouth-wash that will destroy bacteria, and at the same time not become injurious to the mucous membrane. Miller, after repeated experiments, says, "An examination of the above results will soon convince us that there are very few substances at present in the dental materia medica which are available for disinfecting the human mouth." After experimenting with twenty-six different drugs, it was found that with one exception, not one of these drugs would destroy bacteria in less than five minutes, most of them requiring over eight minutes. Out of all the drugs which are used daily, trichlorid of iodin destroyed bacteria in one and one-fourth minutes, saccharin in three-fourths to one minute, benzoic acid in two to two and one-half minutes, salicylic acid in three-fourths to one minute. Of these benzoic acid seems to be the only drug from which a suitable mouth-wash can be made. Listerine and thymol have been favorite mouth-washes in America, but lately a new preparation has become very popular, namely Borolyptol. It is composed of five per cent aceto-boro-glycerid O., two per cent formaldehyd, in combination with the antiseptic constituents of pinus, pumilio, eucalyptus, myrrh, storax, benzoin. Experiments made by able chemists have shown that it is fully as strong and will destroy bacteria as readily as 1-1000 bichlorid of mercury.

I have used borolyptol in my practice for the past year with success, especially in cases of pyorrhea alveolaris, without injury to the

mucous membrane. Miller says, "that trichlorid of iodin is decidedly superior to the bichlorid; it is furthermore far less disagreeable than the latter, in fact, not at all disagreeable; it has, however, most unfortunately, an acid reaction, and is therefore not suitable for daily use as a mouth-wash." Nevertheless, in cases of pyorrhea alveolaris after the deposits are removed, I know of nothing better than the officinal preparation of iodin, saturating the gums and pockets throughout three times a week. It acts not only as an astringent, but it prevents putrefactive changes, decomposes sulphurated and phosphorated compounds; it therefore acts as a powerful astringent and will destroy most forms of bacteria. These two drugs, with a faithful application of the toothbrush, are all that is necessary to keep the mouth in a healthy condition. By this method the worst forms of diseased gums and inflamed mucous membrane can be successfully treated.

In regard to tooth-powder, I feel confident that many dentists make a mistake in recommending nothing but soft substances. One writer upon the subject of oral hygiene says, in speaking of a tooth-powder, "It should contain a scouring or polishing agent of the nature of a minutely-divided powder, such as precipitated chalk." I would like to ask how much scouring and polishing can be done with chalk? There is no objection to using the chalk for bulk, but to scour and polish the teeth I prescribe equal parts precipitated chalk and powdered cuttle-fish, carmin to color, orris root and fine sugar to sweeten. This mixture, when rubbed up and put through a No. 60 sieve, makes an excellent powder which may be used two or three times a week.

THE USE OF SOFT FOIL.

By C. C. Chittenden, D.D.S., Madison, Wis. Read at Twenty-Seventh Annual Meeting of Wisconsin State Dental Society, July 20–22, 1897.

Up to less than forty years ago the only form in which gold was used for filling teeth by all the dentists of the world was soft foil. If the foil "stuck together" or acted "stiff," i. e., was not entirely free from what we now know to be "cohesive properties," it was at once condemned as unfit for use and "probably not properly refined." The gold beaters had great difficulty in overcoming this objectionable property and often had their work to do over again because of its presence. The only way fillings were made was on the wedge

principle of impacting the soft and ductile foil from wall to wall of a cavity so shaped as to be of a general retaining form.

The plugging instruments used, of all shapes and forms, with whatever kind of points, were always perfectly smooth and polished throughout, with large handles capable of being firmly grasped by the full hand, so that great force and pressure could be brought to bear to "pack" the gold against the cavity walls. The commonest form of gold used was about No. 6 to 10 foil rolled into "rope" form. If the cavity was a molar crown, for instance, it would be shaped with nearly perpendicular walls, no overhangs, and the mouth of the cavity slightly larger than the floor.

The end of the rope was firmly folded over the end of a proper sized plugger and expertly packed and fastened into a convenient angle or notch, the plugger withdrawn and caught into the rope far enough back to bring down the main rope into the cavity beside the end already secured, forming a loop long enough to overhang the depth of the cavity from one-sixteenth to one-eighth of an inch. This was repeated until the circuit of the cavity was made, each fold being firmly packed against the preceding one. Then a plugger as large as admissible, with a flat, smooth end, was forced to the bottom in the center and pressure brought to bear in every direction toward the side walls, firmly forcing the loops standing on end against them. This had the effect of forcing the overhanging ends of the loops over the edges of the cavity. Next a large firm roll or pellet of foil was forced into the central pit, then a smaller wedge-point was forced in beside it, and so long as an opening could be made other and smaller pellets were forced into the general wedge.

When this wedging process was complete, the next step was to condense down the overhanging ends of the loops. This was a very important part of the operation and demanded much skill. First a flat-faced smooth plugger (and all pluggers were smooth) condensed the gold straight on end. This left the marginal gold overlying the wall edges. This marginal surplus was then cunningly coaxed toward the center until, if the proper proportion of overhanging gold had been maintained, a perfect and solid margin resulted. In all this process nothing had been done to mar or tear or in any way disturb the integrity of the heavy soft foil, and there was a solid, impervious filling as a result, without the slightest danger of any flaking or disintegration.

Of course it was thought best if possible to keep things dry during all this time, but if moisture or a flood did break in the operator went right on, after letting the patient "spit out."

It mattered little where the cavity was located. The aim in preparation was to secure walls as firm and strong as possible, which continued of nearly equal proportions throughout the whole circumference of the cavity, so that the wedge fastening was complete. To accomplish this the file was a constant necessity. If the proximate surface of a bicuspid or molar was involved and the cavity encroached on the grinding surface, the V file was freely used until even the wall toward the crown surface was firm enough to be wedged against. This left of course a large space between the teeth, just the opposite of what we are to-day taught to consider correct, i. e., the nearest point of contact with the adjoining tooth was next the cervical border and not near the now-called occlusal surface.

It was noticeable too that the file left its trail of lines along the sides of the V, and there was no engine with sandpaper disks to polish them out, but for some unaccountable reason a large percentage of these soft-foil wedge fillings have stood their ground, and have been seen in many a mouth of the passing generation like the Sphynx calmly surveying a surrounding desert waste.

Another form of using soft gold in these cavities was to fold the foil into ribbons of a width one-third greater than the depth of the cavity and roll this ribbon on a square drill point into cylinders of different sizes and density. These were introduced on end and packed against each other around the walls like the loops spoken of, and the final wedges inserted in the center, then condensing the whole on end.

Now, gentlemen, I have told of all this not to try to convince anybody that it is the best and only way to fill and save teeth, but to call attention to a property in gold that I feel is not given enough attention to-day in college training, where young men are supposed to be fully prepared and equipped to do all things required of them in the best and wisest way. Soft gold is susceptible of being brought into perfect contact and adaptation to the side and floor walls of proximate cavities of molars and bicuspids by the wedging process and the burnisher—*more* perfect contact with far less danger of injury to delicate and frail margins of such cavities than the harder and less plastic cohesive forms of gold in general use. With the latter

the mallet is almost indispensable, and in many cases the result of its use is to check, mar and even pulverize the enamel border, thus, although not visible to the naked eye, insuring certain ultimate failure of the operation. This class of cavities is in my judgment least likely to failure by the use of soft gold for the proximate portion, finished toward the grinding surface with any form of cohesive gold desired.

The two best ways of making such fillings, are: First. Use a band matrix not too closely fitting the walls, and so force and wedge soft foil against the walls and matrix as to cause a surplus or overhanging of gold throughout the proximate borders which, after removal of matrix, must be burnished carefully over the margins and properly finished and polished. Second. Make cylinders of soft foil as before described, one-fourth to one-third longer than the lateral depth of the cavity, and so place and wedge them against the floor and walls that their overhanging ends extend into the space, there to be later burnished against and over the enamel margins. It is the simplest matter in the world to complete these operations with cohesive gold, beginning at any point from which forward it is desirable to have a hard welded surface for mastication.

Do not understand me to claim that this is the only successful method of making these operations, but it is certain that if this general method of adapting gold to proximal margins be thoroughly and intelligently pursued, a permanent success is more likely to result than where indiscriminate and unmerciful mallet-pounding is used to adapt stiff and hard cohesive gold to frail enamel margins.

Discussion. Dr. R. G. Richter: I always use soft foil in proximal cavities, because the edges can be burnished over so nicely. I have seen fillings that have stood the test of time, while fillings in the same mouth made with cohesive foil failed simply because of the breaking down of the enamel rods from the force used in condensing.

Dr. R. Maercklein: Cohesive foil may be just as soft as non-cohesive. The difference is, that the latter will not cohere, while the former will stick just where it is placed. If you could key non-cohesive foil there would be no necessity of finishing off the filling with cohesive. If you put enough pressure on it the non-cohesive spreads out like tin foil, and will pack it about the same as tin foil —simply wedge it in.

Dr. B. G. Maercklein: There is a good reason why the work done by the older practitioners stood the test of time better than that performed by the dentists of the present day. The former class were skilled. They had trained their hands and eyes to a degree of perfection seldom reached by the present generation of dentists. And why? Because they had to. With the newer appliances and improvements, such as rubber dam, dental engines, mallets and cohesive gold, have come into the profession a line of inferior skill and deficient development in manipulative ability. The cause of one-half the failures to-day is not the material but the manner in which it is used.

EXPLAINED.—He—"They say iron enters largely into the composition of the human system." She—"I suppose that is the reason a man loses his temper when he gets hot."—*Truth.*

TWO-FOLD EFFECT OF ALCOHOL ON THE MUSCLES.—H. Frey's communication on this subject is based on numerous and comprehensive experiments and tests, principally with Mosso's ergograph. He found that alcohol stimulated fatigued muscles to an increased amount of work, but produced the opposite effect on nonfatigued muscles. It also deadens the sensation of fatigue. He explains its two-fold action as: 1, a paralyzing action (central) deadening the sensation of fatigue, and (peripheral) diminishing the work accomplished by the muscles; 2, a nutritive effect, supplying new fuel to fatigued muscles.—*Deutsche Med. Woch., Aug. 19.*

PHOTO-MICROGRAPHY—The following is perhaps the most simple method of doing what is required. Take a smoothly-planed board about 3 feet by 6 inches by ¾-inch, and straight down the center thereof cut a slot about 2 feet long by ½-inch wide, and lastly, affix on the under side, at each extreme end, a fillet about 1½ inches wide by ¾-inch thick to strengthen the board and raise it slightly from the surface on which it is to stand, level and firm. As the camera to be used extends only 9 inches, a box-like extension piece—adding, say, an extra 4 inches—should be made and fitted to the front. The camera is secured to one end of the board by means of a usual tripod screw passed from beneath through the long slot, and the microscope is so placed, turned horizontally on its stand, that the eye-piece points centrally through the usual lens *mount* into the camera, the junction between the two being made light-tight by a small velvet sleeve having elastic bands at each end. The ordinary focusing-screen is utterly useless for micrographic work, it being necessary to use a piece of thin patent plate-glass, having lines ruled on one side with a diamond. Correct focus is obtained when these lines and the image are seen in focus together through a compound focusser. The condenser and lamp (if the last is used) are, of course, arranged at the other end of the board opposite the microscope and camera.—*Am. Microscopical Jour.*

Digests.

THE MOUTH IS THE VIA NATURA FOR THE ENTRANCE OF DISEASE. By M. V. Ball, M.D. Read before Odontological Society of Pennsylvania, March 13, 1897. When we examine the contents of our handkerchiefs we find that a considerable amount of foreign material has been ensnared, so to speak, in the meshes of the lining membrane of the nose, and so prevented from gaining access to the lungs.

But in the mouth no such arrangement exists. We swallow the air with our food, with the water we drink, and every time we use our vocal organs. But not only from the air is disease—microbic disease—contracted. In the water and in the food itself many forms of infectious organisms reside, and under proper conditions develop disease. Again, the teeth, liable to indentation and decay from use or neglect, are in such a state, like so many little test-tubes of microbe cultures, ready to inoculate the human body whenever and wherever its natural resistance is lowered. Even when the teeth are sound in every respect the spaces between the teeth become stored with food-remnants, which are liable to undergo putrefaction and act as a source of infection.

Bacteria are, as a rule, not very particular as to the source or quality of their nourishment. A minute quantity of organic material and a little moisture is a suitable culture medium for the majority of microorganisms. The refinements of the laboratory media are for other purposes than mere growth. For instance, gelatin media are useful because of transparency, and because they are readily converted into a fluid or solid state as desired. And so with agar, which is used because it remains solid at a higher temperature than gelatin, and can be used in the incubator for days without liquefying. Only a few of the more important organisms require any particular form of food or special degree of temperature, and even these can and do develop under simpler conditions. The secretions of the body, as urine, milk, blood, and saliva, are very good germ foods and have been artificially employed as such. Thus one can understand why the mouth should be a favorable nidus for the culture of germs, and why so many varieties have been found therein.

The father of microscopy, and one might say of bacteriology—Antoon van Leeuwenhoek—in 1683 contributed a paper to the Royal

Society of London, describing a form of microorganism that he discovered in the scrapings from between the teeth. We can readily understand why all of the varieties of bacteria commonly found in the air, food and drink should be found in the mouth. And so various observers since Leeuwenhoek's time have isolated organisms from this location and given them special names. Miller, whose work is classic, has cultivated twenty-five varieties. Biondi in 1887 described five species of pathogenic bacteria in the saliva alone. But besides the ordinary bacteria which accidentally gain entrance to the mouth, a few varieties have been discovered which seem to be normally present and have their residence in and about the teeth. These have been considered as the active agents in producing dental caries and other diseases of the teeth. Recognizing the fact that bacteria of a disease-producing nature are constantly present in the mouth, it is easy to understand that when the mouth is injured systemic infection readily occurs.

Thus the eruption of teeth in an infant is very often accompanied by severe general disturbances—meningitis, pneumonia, convulsions, diarrhea, and simple fever. While many writers are disposed to speak lightly of the process of teething, my own experience agrees with that of many older writers, that the complications occurring during teething are serious and directly due to the eruption. The gums are sensitive, inflamed, and in condition to allow the bacteria ordinarily present in the mouth to gain access to the finer capillaries. A general infection results, and we have perhaps only a mild form of septicemia—fever, diarrhea, etc.; or we have a specific disease, like tubercular meningitis or pneumonia. The bacteria of pneumonia are very common residents of the mouths of otherwise healthy individuals. In uncleanly people and those who fondle the child by kissing the contagion is easily conveyed. The eruptions on the skin, the nasal and aural catarrhs, and the stomach troubles which occur during dentition can all be considered as symptoms of one disease—septicemia.

We are frequently called to treat abscesses in the gums and cheeks, apparently arising from carious teeth. The teeth themselves are not at fault; it is the wound or injury made in the gum by a sharp piece of food, or perhaps inflammation started by the irritation of putrefactive material, that allows the pus-germs to make their way into the tissues. Here, finding a suitable soil, they speed-

organisms of various kinds. The ordinary pus-germs are constantly present in the air, and therefore found very often in the mouth. Miller found the sputum of one hundred and eleven students fatal to mice in one hundred and one cases, and septicemia was produced in nearly all the animals.

The dental caries in itself serves as a focus of disease. Glandular enlargement, especially of the neighboring lymphatic glands, is usually present. The wound, for such it really is, is in constant danger of infection by any of the more dangerous organisms that accidentally find lodgment in the mouth. It is not unlikely that diseases like acute rheumatism, endocarditis, meningitis, and even tuberculosis might arise through this entry. By rubbing vigorously a culture of the stapyhlococcus pyogenes aureus into his healthy arm one experimenter caused a number of boils to appear.

A local tuberculosis has resulted on the fingers of persons handling consumptives, when such fingers were injured. The ordinary scrofulitic swellings of the cervical glands, which are so common in children, are to-day believed to be tubercular—local tuberculosis. Caries of the teeth, allowing the tubercular bacillus of the streets and of the food to gain entrance into the exposed lymph-channels, can thus cause the infection of neighboring glands.

Acute rheumatism, while not known to be dependent on a specific organism, is, however, so intimately associated with endocarditis, which itself is so often caused by the pneumonia bacteria, that it is not too far out of the way to consider rheumatism as probably of microbic origin.

There are probably predisposing causes, but the entrance of germs through the defective teeth is not to be overlooked. I have mentioned dentition as a condition during which the infant is peculiarly susceptible to microbic diseases. Convulsions are probably due to a sudden intoxication by the product of some virulent organism, the onset and termination are so much like acute toxemia.

Although in typhoid fever the tongue and teeth are very much affected by the accumulations on them, commonly known as sordes, yet the abscesses which often arise during convalescence originate probably through the intestinal lesions and not from the mouth.

Of course, any foreign agency which injures the membrane, as plates, artificial teeth, and so forth, establishes the same conditions for the entrance of disease as before considered. And the extraction

ily develop, forming gaseous abscesses and, consequent thereon, general constitutional disturbances.

There are a number of local diseases of the mouth dependent largely on disease-germs. Stomatitis, while somewhat dependent on bacteria for its production, is, however, often caused by other agents and helps to produce a bacterial infection. Thrush, the first disease found to originate from a vegetable parasite, first described in this light by Berg, of Stockholm, in 1846, is a not rare occupant of the mouth. Glanders is caused by a bacillus—bacillus mallei. Leprosy is caused by the lepra bacillus. Actinomycosis, by the fungus of that disease—actinomyces. Gonorrhea of the mouth has been noted.

Tubercular lesions of the mouth, strange to say, rarely occur. The sputum and bronchial discharge, charged with tubercle bacilli, while known to affect the stomach mucous membrane and very often the larynx, does not act on the mucous membrane of the mouth. The sputum has been known to be germicidal for some species. Diphtheria bacilli, for instance, are destroyed in forty-eight hours by sputum, but pneumonia bacteria thrive in it.

There are a number of diseases of the teeth themselves which are supposed to lead to serious trouble in the maxillary bones; as, for instance, various inflammations of the pulp and cement. A number of investigators seem to find specific germs which cause dental caries. As early as 1867 Leber and Rottenstein made public the theory that leptothrix penetrated the dental canal, dilating it, and in connection with acid destroyed the substance. It was thought that the sound enamel could be entered by the bacteria, but Miller proved that this was impossible and that the germ first produced an acid, which, by softening the tissue at some point, allowed the bacteria to enter. Ordinary mouth-fermentations produce sufficient lactic acid to act on the teeth. This fermentation itself is the result of acid-producing bacteria which are constantly present in the mouth. There is no organism that can be said to produce dental caries. Any acid-forming germ—and there are many varieties—can give the first injury, and once the enamel is attacked, caries is certain to follow. The affected tissue then becomes filled with cultures of bacteria, and six species have been isolated from the dentin by Gallipe and Vignal.

It seems more reasonable to suppose that dental caries, like decay of many other tissues, can occur under the influence of pus-forming

was the query. Irritation to cause granulations and protection to prevent their displacement or destruction. Chemical irritants of various kinds were used and their action on the tissue closely watched. Mechanical irritation was also tried, among which was the lancet and the use of barbed or roughened wire, also sharp or irregular edges of different metals inserted in various ways, producing either internal or external irritation of the gums? The manner of protecting the parts was also a study. Several different varnishes were used, also chemicals that formed combinations with the surface of the tissue, producing a film as a protection for the deeper-seated parts. I also used mechanical devices of different forms and materials, many of which were found worthless.

In order to be successful much depends upon the physical and mental condition of the patient, who must thoroughly appreciate the need of the tissues to be reproduced and be willing to cooperate with the dentist and carry out in detail all instructions. Protection of the parts may be secured by a vulcanite rubber hood, which, if carefully made and adjusted, can be worn with comfort. To make the hood, an impression should be taken of the receded gum with modeling compound, taking first only one side, cool the compound and then take the other side, letting the soft compound extend over the hard, remove, place in position and make a model of plaster. I then restore on the model with plaster or wax the absent gum, building as high or a little higher than the surrounding gum. A sheet of thin wax is then slightly warmed and pressed upon the newly built part, letting the wax extend to the surrounding gum and a little distance upon and between the teeth. This may be flasked, packed and vulcanized. Either the vellum rubber or the ordinary vulcanite rubber can be used, as the case may indicate. Platina plate or wire may be vulcanized in the rubber so as to extend between the teeth, and bent so as to hold the rubber hood in position, or ordinary rubber bands may be vulcanized in the rubber so as to be stretched over the teeth for support, or it can be kept in position by silk or wire ligature. Rubber made in this way will form an excellent protection to the parts to be operated on. Tincture of iodin should be used upon the gums until a firm rounded margin is obtained. The irritation is produced just under the gum margin by a clamp made of thin clasp metal, armed with a sharp edge standing at right angles and made of the length and shape to produce the

of teeth is a surgical operation open to all the dangers of infection as much as any other operation. Until the wound made is healed, it should receive the same careful consideration as any other wound artificially produced in the mouth. Not only is it an open wound, but it is a wound continually exposed to the worst sort of infection. —*International Dental Journal, Nov. 1897.*

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REPRODUCTION OF GUM TISSUE. By George T. Carpenter, M.D., D.D.S., Chicago. Read before Chicago Dental Society, October, 1897. What can be done for receding gums? This is answered very quickly by a great many operators, that we can do little to restore this lost tissue; and in my judgment the trouble has been that very little experimental work has been done in this direction, and the literature is nearly silent on the subject. A review of seventeen years shows three articles on sponge grafting and one on the use of resorcin in cases of receded gums.

It is not my purpose in this paper to give the etiology of receding gums, but I would suggest that the receding process be checked and the gum tissue returned to a condition of health before any attempt at reproduction be commenced. All dental operators have seen large proximal and buccal cavities of decay filled with gum tissue, sometimes very vascular, but in other cases this tissue will be found firm and healthy. Ill-fitting plates will sometimes cause a growth of gum tissue. Deposits on the necks of teeth just under the gum margin will in rare cases cause an extra gum development. A lady who was waiting for a friend in my office, called my attention to a full upper plate which she wore. The plate was of rubber and was broken into halves between the central incisors, and in this condition had been worn with comfort for over two years. The gum and mucous membrane of the palate presented a ridge, a section of which would make an inverted T, which extended from the centrals to a line near the soft palate. The membrane was in a fairly healthy condition. The condition of things formed a basis for some experiments. I found that the sharp irregular edges of the cavities or edges of the plate caused the irritation, and the overhanging walls acted as a protection for the new growth. (I do not tell this as new.)

After some thought and work along this line, I was convinced that if the same conditions could be brought about where gum tissue was deficient, that the tissue would be reproduced; but how to do it

hood—scarlet fever, measles, etc., and one attack of pneumonia; otherwise has always been well. Present illness: Began three and one-half months before the operation, in the form of a small swelling in the middle of the right buccal mucous membrane. It grew rapidly with little pain and soon ulcerated. The odor from the mouth increased as the growth increased. During the last few weeks the patient noticed a swelling under the lower jaw.

Examination. In the right side of the mouth a tumor, about three-quarters of an inch below the opening of Steno's duct, of the size of a silver dollar, extending downward and involving the mucous membrane of the inferior maxilla. The surface was ulcerated, the edges indurated and irregular. Under the right inferior maxilla several glands, one of which was the submaxillary lymph gland, were palpated. The cervical glands were not enlarged. Glands on the opposite side were not enlarged. Submental glands were also negative. Of the teeth, the second bicuspid, first and second molars were missing, the others in good condition. Physical examination, negative; the patient somewhat cachectic. Urine negative. A specimen was removed from the border of the tumor and hardened in alcohol, formalin and water for six days, mounted, sections cut and stained. The microscopic examination revealed an alveolar carcinoma.

Preparation for operation. Consisted of mouthwash for one week of a saturated solution of boric acid; on the day before the operation the patient was scrubbed, washed and shaved about neck and face, a wet boric acid dressing applied and only liquid food permitted.

The operation. Anesthetic, chloroform during the early stages, followed by ether, with a return to chloroform at the close. To avoid paralysis of the facial nerve, the lower lip was split in the median line between two Billroth forceps to the lower edge of the chin by means of scissors, and the incision carried on a line parallel with the lower border of the jaw to a point about three-quarters of an inch from the mastoid process. The hemorrhage was arrested by tying the facial artery, veins and branches. The side of the cheek was then lifted, and the tumor and neighboring tissue, three and one-half by two inches, removed, the incision being carried about three-fourths of an inch outside of the mass and as high as Steno's duct. The third molar, first bicuspid and cuspid were extracted, and the mucous membrane of the outer portion of the jaw

irritation where required. This instrument will hug the root tightly and will keep in position. After adjusting the clamp, the parts are then stimulated with a solution of nitrate of silver ℥i to distilled water ℥i. The rubber hood should now be placed in position and the condition watched from time to time. Granulations can be observed and the growth of gum tissue noted. This is my method of reproducing gum tissue, but I do not claim the results will be the same in all cases. You will find cases where the gum could be extended to the grinding surface or cutting edge of the teeth.

There is another condition which I would call atrophy of the gums. The gums are pale and very thin at their margins, there is an absence of the alveolus, and in some cases V-shaped exposures of the root almost to the apex. Treatment: After all deposits are removed the gums are painted lightly with tincture of iodin every second day, also stimulated at intervals with a solution of nitrate of silver, until the festoon becomes rounded and healthy. In case of the V-shaped exposure, a hood should be made as described above, and after the parts are carefully cleansed antiseptically, the margins should be carefully pared and an incision made on either side, passing down close to the periosteum so as to make two flaps which can be brought together with a stitch, using a very fine needle and a silk ligature. When the edges are made to approximate, flood the parts with nitrate of silver ℥ss to the ℥i of distilled water and place the rubber hood in position. Watch carefully for a few days and remove silk as soon as tissues unite. If there is any tendency to gap, touch the edge with crystal nitrate of silver.—*Dental Review, Nov. 1897.*

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REPORT OF A CASE OF CARCINOMA OF THE BUCCAL MUCOUS MEMBRANE. By Geo. J. Dennis, M.D., D.D.S., Chicago. Read before Chicago Odontographic Society, Oct. 1897. In presenting a report of a cancer of the cheek, it is not with the idea of presenting anything new or unusual, but because of the interest of the case to the writer, and because he believes that a description of the case and the operation for the removal of the tumor will be of interest to the members of this society.

The report is as follows: Mr. R., age fifty-four. Family history, negative. Personal history: Habits—Uses tobacco moderately, smokes occasionally, chews on the left side, and drinks alcoholics very moderately. Previous diseases: The usual diseases of child-

once to die. But there is a balm in Gilead, and it is that which I have brought you; its name is "hydronaphthol." The makers state as follows: "Hydronaphthol is a perfectly harmless, odorless, non-poisonous, non-corrosive, antiseptic, germicide, preservative, anti-ferment, and disinfectant. Its name indicates a descriptive fancy word which is used to designate a certain secondary compound derived from beta-naphthol by reaction which changes its molecular constitution by means of inorganic compounds that do not enter the molecule, and are finally removed, whereby ninety per cent of a product is obtained, melting at 116° F."

Hydronaphthol is soluble in the following proportions: In alcohol, about 1 to 2 parts; in hot water, about 1 to 300 parts; in cold water, about 1 to 1100 parts; in olive oil, about 1 to 20 parts; in ether, about 1 to 2 parts; in chloroform, about 1 to 2 parts. It is also freely soluble in benzol and the fixed oils. Alkaline solutions dissolve it readily, but greatly reduce its antiseptic properties.

Hydronaphthol possesses one-fifth the antiseptic strength of mercury-bichlorid, double the strength of beta-naphthol and iodoform, three times the strength of salicylic acid, and about fourteen times the strength of carbolic acid. Unlike all these antiseptics it is absolutely non-poisonous, and can be used with perfect impunity as a preservative in cases where no other antiseptic could be used at all. It is claimed that a solution of one to ten thousand will prevent fermentation, but, to arrest the action of putrefactive germs already formed, stronger solutions are necessary.

Whatever hydronaphthol may be, scientific chemical experts have shown that *it is not* beta-naphthol, and medical experts are satisfied that it is a product which produces a physiological action in which all the disadvantages arising from the use of other hydro compounds of naphthalin are entirely removed. Thorough and exhaustive tests and experiments by painstaking, scientific investigators in hospital and private practice have established its claim to a prominent and permanent place in the field of antiseptics, because in surgical dressings it is sufficiently soluble to effect thorough antisepsis of the wound discharge, and sufficiently insoluble not to be readily washed away from the dressing by the discharge: It is non-toxic, and may be given in three-grain doses as an intestinal antiseptic in cases of typhoid fever and cholera. Leading American and English physicians have published statements to this effect. In germicidal powers

and the alveolar process were removed. The hemorrhage from the jaw was stopped by means of the Paquelin cautery. The submaxillary lymph and salivary glands, as well as all the other submaxillary glands were then removed, because adherent. The submental glands were searched for, but none were found. These are not always present (Henle).

A measure of the denuded surface was then taken with gutta-percha tissue, and a flap was dissected from the neck and infraclavicular region, leaving a pedicle sufficient for nutrition of the detached skin. After this the flap was carried up and stitched into the denuded area of the cheek. The cheek was then brought forward to place and the first incision through the lip and along the jaw was closed by interrupted sutures, except that portion through which the flap from the chest was carried. Retention sutures were applied to the denuded area over the chest to diminish the wound as much as possible and the remaining uncovered surface received a covering of iodoform gauze. The wound was now dressed aseptically, with the head drawn toward the right shoulder to lessen the tension on the flap. The dressings were changed frequently because of the passage of secretions from the mouth between the flap and the jaw.

Twelve days later the flap from the chest was incised from its pedicle near the opening into the mouth and returned to its place on the chest; the separated portion was carried inside of the mouth and sutured to the mucous membrane at the side of the tongue, and the original opening along the jaw, which had been only partially closed, was now completely closed. The remaining uncovered surface of the chest was filled in with Thierch skin grafts.

It is due to Dr. Schroeder, who perfected the operation, to state that another operation for the removal of the cervical glands will take place in order that metastatic growths in other parts of the body may be prevented.—*Dental Review, Nov. 1897.*

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HYDRONAPHTHOL—WITH SUGGESTIONS FOR ITS USE IN THE TREATMENT OF THE DENTAL PULP, ALIVE OR DEAD. By Sidney S. Stowell, D.D.S., Pittsfield, Mass. Read before the First District Dental Society of the State of New York, March 9, 1897. That I have discovered the elixir of life I do not claim, for it is appointed unto all men, and some teeth,

it ranks second to mercury-bichlorid, but being non-poisonous, non-corrosive, and harmless, it is preferable to that substance not only in surgical practice, but in the arts also as a preventive of fermentation, etc. It preserves anatomical and pathological specimens in their natural condition, preventing shrinkage or decay.

A. B. Griffiths, Ph.D., F.R.S.E., F.C.S., in his "Researches on Microorganisms," writes, "Hydronaphthol is of great value as an antiseptic agent in surgical operations, etc. A solution one to eleven hundred destroys bacillus subtilis, micrococcus tetragenus, micrococcus prodigiosus, bacillus anthracis and its spores, sarcina lutea, and other microbes, for they cannot be cultivated after its action." * * * Dr. J. C. McCoy, New York, writes, "After a daily use of hydronaphthol as an antiseptic and disinfectant for several years, I consider it preeminent as a dental antiseptic and disinfectant, and for practical purposes it will supersede all other antiseptics in the practice of dental surgery." * * * Dr. C. A. Meeker, Newark, N. J., writes, "I am greatly pleased with the antiseptic properties of hydronaphthol. I believe them to be far higher than carbolic acid and other antiseptics, and the fact of its being non-poisonous is a great factor in favor of its use in general dental practice. I have used it for several years and shall so continue." * * * Alex. Edington, M.B., C.M., Edinburgh, writes at length of his experiments with hydronaphthol in hospital surgery and private practice, comparing its efficiency with carbolic acid, claiming great superiority for hydronaphthol, and concludes by saying, "there can be no doubt of the fact that in this agent we have an ideal antiseptic, and a solution of one in three hundred in warm water possesses very great germicidal power, and such will be found of the greatest service in washing out septic cavities and wounds." * * * Dr. John I. Hart, New York, writes to me, "I have used hydronaphthol, saturated solution in alcohol, in root-canals; also mixed in equal parts with zinc oxid, then with zinc chlorid as a permanent root-filler; also mixed with zinc oxid and creosote or oil of cloves, placing the paste thus formed over a layer of dentin too close to the pulp to remove, and over this paste flowing oxyphosphate cement, also with tannin and glycerol in pyorrhea-pockets."

That I might prove it well I have used the drug constantly for more than five years to the exclusion of nearly every other antiseptic agent, and with such phenomenal success that I deem it my duty

to the profession which I represent, and to humanity at large, that I present its merits here. I use hydronaphthol principally in two forms, the twenty-five per cent alcoholic solution and the powdered form. In all cases where an antiseptic solution is required in dentistry I use the alcoholic solution, often reducing it with glycerol or water as the case may require. In the treatment of a putrescent pulp-canal, the penetrating property of the alcohol and its affinity for moisture carries it laden with its hydronaphthol in solution to the remotest nook and corner of the pulp-chamber and canals however small, even to the apex and through into the soft tissues, as well as into the tubuli of the tooth. The alcohol having thus penetrated every part it at once evaporates, leaving the hydronaphthol to do its perfect work of disinfection.

We all know with what fear and dread we have opened into a pulpless tooth of long standing, having no open fistula, and what dire results have followed, supposed to be the result of a multitude of hungry microbes rushing into a fertile field. An inflammation is at once set up which is almost unbearable, the quickening pulse and rapid breathing soon indicate a high fever, and often for two or three days or a week the patient, whether a robust man or a delicate woman, will be confined to the bed in a dark room, there to writhe in agony until suppuration of the inflamed part takes place and the pus burrows its painful path through the plate of bone and soft tissues, and finally breaks and discharges. In the meantime the physician and dentist have been in almost constant attendance, using all the known remedies for such cases, and neither doctors nor medicines have really done any good, other than to encourage and speak good cheer to the suffering martyr that for all this agony he will still retain the tooth, that it may yet become useful. We have all been through this experience, either personally or with our patients, and all have realized how powerless we were with all our drugs to relieve our patient's suffering. Gentlemen, I make the statement here that when an old pulpless tooth is opened into, if the alcoholic solution of hydronaphthol is at once placed in the pulp-canal, the conditions referred to are *absolutely impossible.*

I will now refer to another use of hydronaphthol which I have found of priceless value, and so far as my research has extended I may claim originality. I refer to the combination of the powdered hydronaphthol with the zinc oxid of our common oxyphosphate

cement. I combine in parts one-quarter of hydronaphthol to three-quarters zinc oxid, mixing this combination with the phosphoric acid, and using as any oxyphosphate cement for pulp-capping and for protecting permanently all exposed, sensitive or soft parts in live teeth as an antiseptic, non-irritating lining for all classes of fillings. I first bathe the cavity with the alcoholic solution, which penetrates the soft, leathery decay as well as the tooth-structure; the alcohol soon evaporates, leaving a deposit of hydronaphthol in the cavity. I now either line the cavity or fill it entirely with the hydronaphthol cement, which is rendered non-irritant and antiseptic by the presence of the hydronaphthol incorporated into it. I sometimes incorporate a little oil of cloves or carbolic acid with this cement, which acts favorably as a local anesthetic; with this addition the foregoing treatment may be applied to a tooth with a pulp slightly or nearly exposed, which has ached some or may be aching at the time of presentment, with almost positive assurance of successful results and without pain to the patient, who should be instructed to call again in a few months for a more permanent filling, when the tooth will be found to be quite free from sensitiveness; the cavity may now be more thoroughly prepared and a more permanent filling placed in it, lining the cavity again with the combination cement. If, however, the cement is not badly worn, it may be left for a much longer time with still better results.

The addition of hydronaphthol to the cement in the proportion mentioned reduces its wearing quality but slightly if it is mixed hard, but as we use the cement quite soft in the treatment of such cases, its wearing quality is of course impaired. Now whatever of moisture may remain in the soft decay or in the tooth structure, or may be secreted by the pulp (there being no such thing as a permanently dry tooth in the mouth), on coming in contact with and acting upon the cement-lining, immediately sets free more hydronaphthol which at once acts to keep the parts in a thoroughly antiseptic condition, while good old Dame Nature, ever ready and willing to heal and restore her diseased and lost parts when given an opportunity, goes quietly and peacefully on with her perfect work of recalcification of the affected tooth.

I will say that the results thus obtained have been little short of marvelous, as I have taken liberties with hypersensitive and soft teeth by leaving the soft sensitive decay undisturbed in the cavity,

treating it as before mentioned to the delight and comfort of my patient, and assurance to myself that I have put natnre at her best to restore the affected part to a healthy and normal condition, less the part lost by the first attack of the deadly microbe. I make the claim, and in good faith, that by this treatment in general practice I will save more teeth with living healthy pulps and with vastly greater comfort to my patient than anyone else can do by thorough excavating, as suggested by Dr. Ottolengui in his recent discussion of Dr. Williams' paper. I make still further use of hydronaphthol by combining it with the zinc oxychlorid, in the same proportion as with the oxyphosphate cement, as a permanent root-canal and pulp-chamber filler; especially is it valuable in this form where we are not sure that we have thoroughly cleansed the canals, as is very often the case with molar teeth when a "mummifying" agent is required.—*Dental Cosmos, Nov. 1897.*

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REPORT OF A CASE VERIFYING THE STATEMENT FIRST MADE BY DR. M. H. CRYER, SHOWING DIRECT COMMUNICATION OF THE FRONTAL SINUS WITH THE ANTRUM OF HIGHMORE. By T. W. Brophy, M.D., D.D.S., Chicago. Read at American Dental Association, August, 1897. The superior right bicuspid and molar teeth had been removed and a small opening made into the antrum before the case came into the hands of Dr. Brophy, irrigation being carried in by syringing daily with the usual antiseptic solutions. No satisfactory progress being made in arresting the disease, the patient was taken to Dr. B. for diagnosis. Exploration by means of a silver probe revealed no diseased bone, and a more extensive opening and also a more thorough drainage was recommended. The patient seemed at first to improve after the operation, but after home treatment for two or three months returned in the original condition. It was then decided to remove a greater portion of the anterior wall of the antrum. The operation revealed a thickening of the mucous membrane with polypi upon its surface, besides a small piece of rubber tubing which had been lost in the cavity. The cavity was thoroughly curetted, packed with boracic gauze, the packing was removed daily for about a week, when a hard rubber canula was made retaining full size of opening, preventing closing of opening by granulations and enabling to thoroughly irrigate the cavity and watch the process of repair.

The accumulation of pus persisted at the upper nasal surface of the cavity, and after two or three months of the most vigorous treatment, it was decided that the frontal sinus must be involved. Accordingly an operation was made opening the sinus, which was found to be filled with pus. The anterior wall of the frontal sinus was removed, exposing the cavity to view, when it was found to be denuded of membrane. By carrying the incision downward along the inner canthus of the eye a silver probe was passed directly into the cavity of the antrum without obstruction. Water was forced into the frontal sinus, which readily found its way through into the antral cavity. Pus also dribbled from the region of the ethmoid cells. These cells were curetted, some diseased bone removed, and the whole thoroughly irrigated. Irrigation and antiseptic dressings, together with the insertion of a drainage tube, completed the operation, suppuration finally ceasing, though a thick glossy mucus occasionally comes from the nasal cavity. This case, in the judgment of the writer, had its origin in a dental alveolar abscess of the teeth which had been removed before the patient came to him. The cure of cases of this character could not possibly be effected by opening and treating central cavity alone. * * * The feature especially presented was the anatomical relation of frontal sinus, infundibulum and antrum of Highmore.—*Ohio Dental Journal, Oct. 1897.*

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STRUCTURAL DEVELOPMENT. By C. N. Peirce, D.D.S., Philadelphia. Read at American Dental Association, Aug., 1897. In connection with Section VII, Dr. W. C. Barrett, chairman, placed on exhibition an immense collection of human and comparative odontology, which Dr. Peirce described as presenting an array of landmarks rarely seen in a meeting or an association of professional individuals, unless of a strictly scientific character. He said: Each one of these representations has a history, and from each one, the nearest akin but more complex, has derived some organ, trait or peculiarity essential to his being, and this is true from the most simple to the most complex—from the Batrachian to Man. The organs which are held in common indicate the road that has been traveled from the most primitive to the most highly specialized. The general plan of construction was a unit; the divergencies in response to the necessity of adaptation to environment, intensified by inheritance. It is a recognized fact that any change in the circumstances,

that is, in the sum total of influences affecting any organism, will be likely to work some alteration in that organism or in its descendants, or in both.

The teeth are of more interest to the dental profession than any other set of organs considered separately, and yet these organs subserving nutrition cannot be studied without a marked correspondence with organs being noted. A suggestive query is, "Are the teeth, with other organs of living beings, adaptive or non-adaptive? Are they machines especially fitted to meet the demands of their environment, or are they not?" The question, "Did the occasion for its use follow the appearance of the structure, or did the need for the structure precede its appearance?" is answered in the words of the late Professor Cope, "Animals and plants are dependent for existence on their environment;" "Changes in environment occur without any preparation for them on the part of living things." "The influence of environment is brought to bear on life as it is or has been and special adaptations to it on their part must follow, not precede, changes of climate, topography, population, etc." Another consideration is the well-known and recognized influence of use, motion, on nutrition—the law of use and effort—kinetogenesis.

In the study of the teeth it is not difficult to recognize that there are certain central or primitive types, from which it is easy to derive other related forms of detention by simple addition, subtraction or modification of parts already possessed. The so-called teeth of the invertebrates are enderonic in origin—an oral armature with nothing in common with the teeth of vertebrates except their similar functions. The teeth of the vertebrates are enderonic in origin, in shape and function ranging from a simple cone for seizing and retaining, to the incisors for cutting, cuspids and carniverous molars for tearing or lacerating, and tubercular for crushing, and the complex grinding molar of the omniverous and herbiverous for the trituration of food.—*Ohio Dental Journal, Oct. 1897.*

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CLINICAL REPORT ON METHOD OF OPERATION. By Dr. H. C. Register, Philadelphia. Before Academy of Stomatology, March 23, 1897. Individual methods of operating are of minor importance if they do not possess a qualifying reason why they are so done, embodying a "principle" that applies in all like conditions. That which is involved, as a principle, in the manipulation of gold

as performed by myself on Saturday last, consists in adapting gold in regulated lamina, in opposition to an irregular form of cohesive work, and the fixation by forcing it to place by strips of bibulous paper or old soft linen, thus making a tight joint by packing the gold to every point of contact by the same effort, in opposition to retainers, cohesive and otherwise, which when done by instrument points are more likely to let some inequality remain, and also wound the finished tooth tissue, which is detrimental to the saving quality of the filling so far as it makes an inequality, thus preventing the hardening of the dentin beneath it.

The calcification of the fibrillæ, I claim, always takes place in forming a zone of secondary tissue in a filled tooth when the mechanical and physical relations are made compatible with each other, to the exclusion of recurring exciting causes of caries. Metal fillings, through their thermal irritation, produce that result sooner than the zinc or gutta-percha. To this end the formation of cavities should conform to the natural cleavage of the enamel, which radiates from the stratum granulosum to the periphery, and, after Williams, are held together by the interprismatic cementing substance. An enamel wall, under the best conditions for its future preservation, should stand in this relation to the filling, the length of the enamel prisms, where possible, reaching from the enamel cuticle to the stratum granulosum, with the surface made smooth. In all cavities thus formed we get, as an anatomical result, a V-shape to a greater or less extent, this being natural as applied to enamel.

In connection with this and all other forms of cavities, I cannot lay too much importance upon the sterilizing and alkaline influence of bathing the cavities with iodin, and decomposing it and all carbohydrates and starchy matter, including germ-life, which is in the main composed of the latter material, and of placing the inner enamel and dentin in an alkaline or neutral condition before filling. The changes in the tissue are as great as apparent, permitting and producing an antithermal change through secondary dentin more quickly, and anticipating the action of germ-life left in the tissues.

The use of a matrix in connection with this method, and all others as well, should stand as a necessity only, in giving expression to the cavity—*never a positive, fixed, artificial wall.*

As the environment of the tooth will be the exciting cause of future caries, the filling must anticipate, so far as possible, the dis-

solution of the interprismatic cement or the calcoglobulin, as pointed out by Williams, before a recurrence of decay can take place in any part of the filled border properly protected by the gold. To do this best is the aim of all honest operators. I present this method not as one of an hour, a day, or a month, but one that has stood the clinical criticism of fourteen years as a system, with the good work continuing to preserve badly broken-down teeth, as observed from carefully kept charts that tell the conditions then and now.

When one or more of the walls are broken, a matrix becomes a necessity, and here planished copper or german silver works best with me, always fitting it to the individual case. This may be done by soft soldering the ends or using the silk ligature, which I generally prefer, winding it round and round the matrix to its width, which comes to the bulbous portion of the tooth only. To planished copper, which is rendered so pliable and dead by annealing, I give the preference for making all kinds of matrices.

If it is desired to give the filling an oval form or contour at the knuckling point of contact, it is necessary only to hold the copper strip, before cutting, in the palm of the hand or some fairly soft surface and burnish it to the extent required. The ligature takes it to place uniformly throughout the boundary line and leaves a mold to be replaced by the filling.

Gold cylinders, the length of which correspond to the cross-axis of the cavity, are now laid on the bottom and sides and pressed to place by bibulous paper folded once, or as many times as will correspond with the work in hand; and soft linen cut into strips is to be used in like manner without folding, and in its preparation must always be cut, never torn. After the gold has been pressed to place under paper by "plugging pliers" (a special form is best), the ends of the cylinders are *turned over* and *around the cavity*, *between* the *tooth* and the *matrix*, or the first cylinders may be placed and adapted under the bibulous paper, the edges of these turned over the border of the cavity at the cervix, and the matrix then applied as described, pressing against the cylinders, the operation being continued by the use of mat gold and malleted to place with the paper upon the gold, followed after its removal with proper small, smooth points until all parts of the boundary, as you progress, are filled *without the instrument coming in contact with tooth-structure.* After the enamel has been thus protected, to a greater or less

degree, not being so essential as with dentin, the cohesive gold can be added wherever the masticating surface or contour calls for it. In the larger restorations the borders of the filling should be composed of cylinders carefully laid in contact with dentin and enamel throughout the joint contact in lamina. The center or body may be filled with mat or crystal gold, as the air-spaces in the work are in no way detrimental. The time thus gained is all secured by the use of soft gold, it permitting of about two-thirds of the cavity being filled in one-third the time, as a gain over cohesive work.

No special retaining device, as a rule, is necessary, other than a slight irregularity that may naturally exist; otherwise undercuts should be slight, and to see that the pounding and triturating forces of mastication are met by the cylinders being anchored as much within the body of the tooth as extending beyond the cavity, in restoring the contour to any required form.

This method of operating, I believe, is in direct line with the latest discovery in histological research in its relation with the several anatomical parts of tooth-structure, both mechanically and physically related, and as a protection from the microgerm environment. Thus do we find non-cohesive or soft gold laid in lamina in juxtaposition against dentin and enamel, in contradistinction to small pieces being added cohesively in retainers, to be no veneer but of better grain, and being opposite in all its relations as a tooth-preserver, both physically and mechanically.—*International Dental Journal, Oct. 1897.*

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TO DEPOSIT PASTE IN CAVITY. By J. H. Hughes, D.D.S., Goshen, Ind. In capping small exposures, or when putting cement into an excessively sensitive cavity, I am accustomed to use a stiff paste of white oxid of zinc and oil of cloves next the pulp or dentin. I found it difficult to carry this paste to the exact spot and leave it there, owing to its strong inclination to stick to the instrument used in depositing it. Finally I discovered almost by accident that if the paste were made into a little ball it could be carried to the cavity and placed exactly where needed, or spread over the exact amount of surface required, by using a bit of spunk in the pliers, as carrier and spreader; the spunk coming away almost clean, or at most with only a little oil upon it. This is a little point, but it has given me a great amount of satisfaction.—*Dental Review, Oct. 1897.*

USE OF SCREWS. By H. W. Arthur, D. D. S., Pittsburg. Read before Pennsylvania State Dental Society, at Glen Summit, July 6, 1897. Cohesive gold and the control of conditions afforded by the introduction of rubber-dam made possible large restorations of broken-down tooth-structure. The use of screws in dental operations was born of the necessity for greater security for retention in restoring and contouring, and it is to this class that the use of screws is specially applicable. While crowning has taken the place of building up in extreme cases of restoration, the usefulness of screws has not diminished, but has rather increased. By their use foundations may be made for crowns on roots that would otherwise be useless. By the use of small screws, in many cases security of retention can be had where undercuts and grooves would endanger the pulp and throw the strain for retention on structure already greatly weakened. In the minor cases of restoration or contouring where the small screws may be used, the screw does not seem to have had the recognition that it deserves. It may be claimed for it that (if judiciously inserted in those parts of the teeth best able to bear the strain) it gives the maximum retention security with the minimum loss of tooth-structure. The use of the screw, as has been intimated, is in those cases where extra retention security is wanted, and it does not supplant old methods of retention in ordinary cases, though in many it may supplement.

In this model we have assembled a number of typical cases where screws may be used, some where their use would be good practice, and others where their use would be more positively indicated. Taking those where their use would be good practice, we would present first a central incisor with a large cavity on the distal surface; the incisal angle is weak. For filling the cavity as it is, the ordinary methods of retention would be indicated; but if we take into consideration that the incisal angle is liable to fracture, and there may be objections to anticipating this by cutting it away, the resort to the use of screws is certainly good practice, as it will not only afford security for retention as it is, but also in the event of fracture, in which case an additional screw near the incisal edge will give security for retention in restoring the incisal angle.

The upper first bicuspid is another case of this class. The tooth has a filling on the mesial surface extending across the occlusal, including the distal surface. The disto-bucco-occlusal angle is con-

toured. A screw was placed at the disto-bucco-gingival angle. The lingual surface is broken off, leaving the filling exposed along the entire lingual side. We have here ample space and room for placing two screws, which will give retention security for restoring the lost part and will assist in retaining the first filling.

The lower first bicuspid, together with the second bicuspid and the first molar, show another class of cases where the small screws may be used to advantage. It is noticeable that the occlusion on the first bicuspid distal surface is close, dipping into the cavity space. This might be filled successfully by undercutting, but with less loss of tooth structure, with greater retention security, and with more ease by the use of a screw. The disto-occlusal angle is wanting, so that a screw can be readily placed pointing toward the mesio-lingual angle.

In the lower second bicuspid the mesio-buccal and lingual angles are broken down; the sulci have no faults; the bite is close; there is a broad seat for the filling at the gingival line. The opposite point of retention, by the ordinary methods, would be made by undercutting near the occlusal surface. or cutting through that surface into the sulci for anchorage. By the use of a screw anchored in the strong body of sound tooth-structure, as shown, near the occlusal surface, greater security for retention can be had with no weakening of the tooth structure.

The lower first molar is somewhat similar; in this case the strain being greater, a larger screw may be used. Placing it in the body of the tooth, near the occlusal surface, a seat is made for a small screw near the mesio-bucco-gingival angle, and others might be placed. Another in this class of cases where the small screw may be used to advantage is shown by the tooth in the place of the upper second molar; the tooth is an upper third molar. It is in that tooth, in place, that screws may be used as here shown. Screws are placed through cavity, near the disto-gingival line angle, in the dentin.

Where the breaking down of the angles necessitates a resort to contouring, the use of screws is more positively indicated. The point of opposition for wedging in these cases by the ordinary methods is wanting, unless resort is had to deep cutting, which will endanger the pulp, and even then will not afford the security for retention which can be had by the use of screws. We have here in the model several cases of that class.

There are other cases where the use of screws is positively indicated, where retention security cannot be had without them. The upper cuspid is an example of this class. It is worn down about one-half, is perfectly sound; the pulp-chamber is well protected by secondary dentin. In this case, without disturbing the tooth-structure other than for placing screws, perfect retention security can be had. In many cases where access may be had to the pulp-canals, screws of the larger size may be used and supplemented by smaller ones. Where roots are badly broken down, so that the margins are wanting, the use of screws for securing a foundation of amalgam for crowning cannot be overestimated.

The location of screws is a matter of considerable importance. It should be at a point readily approached for inserting both the screw and the filling. It should be as far as possible from the pulp and not too near the margin of the tooth, and consequently at a point where there is the greatest bulk of tooth. In the incisors and cuspids the point that meets these requirements best is the linguo-gingival angle, either mesial or distal. This point should be made accessible by free cutting if need be, as it will not weaken the tooth. With caution screws may be placed at the labial angles. Usually it will require considerable space, but there should be no hesitation about making space, as a little more exposure of gold is a matter of small consequence compared with that of avoiding the pulp and margin and getting the screw fixed. Where there is sufficient space a screw may be placed near the incisal edge in the dentin, otherwise there is a liability of encroaching on the enamel plates or the pulp by placing a screw at this point. In the bicuspid and molars where there is sufficient space (and in many cases it would be good practice to make space), the best point is in the center of the body of the tooth, near the occlusal surface. In many cases we have to be governed by the convenience of approach and the relation of the pulp in selecting the point for placing a screw. Where the course of the pulp-canal is used for placing screws, the shape of the roots and their size should be considered, especially in the posterior teeth, where large screws are used. For cavities in the upper molars the lingual root is the best, as it is the largest and most readily approached. For securing a foundation for crowning it is best to put in two screws. This can be done in bicuspids and in molars by using more than one root. In regard to the use of screws in practice, many no doubt

"lose the good they oft might win by failing to attempt," and others by failing in the attempt. It would seem to be a simple operation to place a screw, and yet to be successful care must be taken in each detail, and always especially in placing the small screws.

To avoid confusion care should be taken in the selection of the size of the instruments and screws; and where these are not fixed in sets, they should be tested *always* before using. This confusion can in a great measure be avoided by confining ourselves to the use of two or three sizes of screws; in most cases two will do—the small-size anchor screw, 100 threads to the inch, and a large size about forty-eight threads to the inch. For the anchor screw there is a set of instruments complete that could not well be improved upon, though there may be a choice of these. When no drill is furnished with the tap and carrier it is well to test the drill as to size each time before using. As to the manipulation in the use of the anchor screw, having decided where we will place our screw, we should make sure that the way is clear to direct approach to that point. The first step in the manipulation is to countersink with a small round bur a seat for the filling at the point where the drilled hole is to be. With a "limit drill" in the engine, carry the drill steadily up to the shoulder, and then withdraw quickly while it is revolving; if allowed to stop it may break off in the drill-hole when you attempt to remove it. Take the tap, place it cautiously in the drilled hole, give one or two turns; when it is engaged let it be free, so that it may line up with the drilled hole, repeating this procedure with gentle pressure until the tap is arrested. It must be kept in mind that the instrument is a very delicate one and may break in the hole if not handled with great carefulness.

We prefer the screw-chuck as a carrier, because we can regulate the length of the screw and the screw is held firm, so that in placing it the thread on the wire or in the tooth is not liable to be torn. With the screw in the carrier the procedure should be the same as with the tap, leaving the instrument free after every few turns, that it may be in a line with the drilled and tapped hole. It should be tested by gentle turning to make sure that it is fixed. Then loosen the handle from the shaft first; unscrew the shaft from the anchor screw. A word of caution: the drill and tap being more slender than the chuck-screw carrier, it must be borne in mind when using the former that room must be left for the use of the latter, so that

it may not come in contact with the tooth at any point other than the seat of the filling, when the screw is placed or being placed.

The placing of the larger screws in the pulp-canal, while not requiring the same delicacy of manipulation, requires care. Where the roots can be approached directly but little difficulty will be experienced; where they must be approached at an angle, as in the case of the lower second molar in the model here shown, the main difficulty is in making the drill-hole in a line with the course of the canal. The right-angle attachments do not supply the need. An instrument such as we have here is one that can be depended upon; the reach is long enough and yet not too long; the shifting angle is the main advantage to be had in its use. The short finger chucks can be used for tapping and placing the screws. The presentation of our subject—the use of the screw for filling, and especially the use of the anchor screw—is not complete without some reference to the manipulation of the screw in filling. The object in making a seat for the filling, in which the screw is placed, is to give stability to the filling. And this is accomplished by condensing the gold around the base of the screw and following it up until the screw is covered. When we consider the limited amount of surface the screw presents, we can understand how necessary it is to condense the gold well to make it secure. For this reason we would advise the use of small pointed pluggers, straight and contra-curved. Gold should be worked all around the screw from the first, and not wedged in on one side, leaving the other side unsupported. Some object to the use of screws on account of the complications and care necessary in placing and filling, but this has no weight compared with the security and results attained by their use.—*Dent. Cosmos, Oct. 1897.*

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DENTAL EDUCATION. By Dr. Montell. Read at Union Meeting of Maryland State Association, Washington City Society, and Virginia State Association. Dental education is for the purpose of making dentists, and this purpose is what is supposed to animate not only the faculties of the various colleges and the profession, but to render necessary the creation of various governmental supervisors, in the shape of state boards of dental examiners. Dental education may be divided as regards quantity and quality, and under these heads the writer will endeavor to point out what he deems the defects and suggest such remedies as appear feasible.

We will first consider the quantity of education received by students in our institutions, and we will assume, so far as the quantity is concerned, that were the pledges made in the catalogues of dental colleges fulfilled the student would be well grounded when his diploma was granted. But is this the fact? Do we not all know that many of the announcements which look so well on paper are but the buncombe of the demagogue who deludes the people with promises never intended for fulfillment? We find on paper an array of "ologies," the mastery of which would entitle any one man to marked position among the scientists of the day, and yet upon investigation of the facilities of the institutions so advertising we find that they have within their walls neither the facilities for teaching nor the pretense of so doing.

Bacteriology, histology, pathology, and chemistry have become recognized as essential to the education of a dentist in our day, and there seems to be a universal disposition on the part both of the profession and the students to demand such instruction in these branches as will enable them to intelligently pursue the practice of dentistry, and this brings us to the second head of dental education, viz., quality.

Do our colleges generally teach these branches in such shape and manner as are suggested by the special needs and requirements of the dentist, or is not the dental student left to drag from the mass of general knowledge on these various subjects such portion as he may suppose will be useful to him? How much better would it be if these branches were so specialized that the dental student was taught such portions only as had relevancy and bearing upon his specialty alone, than to be compelled to spend many precious hours in laboratories engaged upon general investigations that, while useful, as all knowledge is, cannot repay him in even the smallest degree so well as special knowledge pertaining to his own profession would. As previously stated, the object of dental education is to create dentists, not men whose widely diversified knowledge would simply entitle them to be "Jacks of all trades;" therefore let us not compel our students to waste their money and, what is far more valuable, precious time in acquiring vast stores of disjointed knowledge, having but a remote bearing upon their own chosen specialty. The writer trusts that his views will not be unjustly nor hastily condemned, as he fully appreciates the value of all knowl-

edge; but he does emphatically wish to enter a plea for specialized instruction in such branches of dentistry as are allied to medicine, and he ventures to predict that the day is not far distant when the dental student will demand for himself just such a course of instruction as is herein outlined. It is due to these defects in our system of dental education that it has been found necessary by the profession to establish such a safeguard to its portals as the various state boards of dental examiners, for that supervision so necessary to protect themselves and the public from imposture and incompetency. If it is necessary that a dentist have the same medical knowledge as a general practitioner of that science, then make it a requisite that every matriculant of a dental college obtain first his medical degree; but if, as the writer believes, it is not necessary that he be so instructed, then let such time as he be required to spend in learning the collateral branches be spent upon such portions only of those branches as will assist him to the better understanding of dental science. While dentistry is probably a specialty in medicine, yet it has of its own nature many features independent of that science, though founded more or less upon its principles, and practiced more intelligently through a knowledge of the same. There can be no question that the recognition of these facts has done much to advance the status of dentistry as a profession in the estimation of the masses, but the writer doubts if the results have been the making of better dentists in the practical every-day work of the profession, except in so far as the increased curriculum has demanded of the dental student a higher grade of preliminary education to enable him to comprehend and master the details of the new branches added to his former studies; and while these men may be better equipped so far as the theories and principles of our science are concerned, the writer doubts if in the practical work of dentistry they have advanced proportionately, or rather advanced at all. Has it not been apparent to us all that the ability to intelligently comprehend a new fact is in direct proportion to our training in the line of that fact? And as that fact has bearing upon other facts with which we are conversant already, even so in the study of dentistry facts which have but a remote bearing upon that science are the more difficult of comprehension to the average student, and serve but to distract his mental energies from the study in which he is engaged. But on the other hand each new fact, the relation

of which to dentistry is evident to the student, once acquired is but an additional incentive to further study, and renders the acquisition of higher attainments easier and lighter and adds new impetus to his labors.

The writer desires it to be distinctly understood that he has no wish to either lessen the labors of our dental students or to abolish in any manner the branches which are taught in any of our reputable colleges. But he does desire to bring out two facts of, to him, great importance. He has found from personal experience in teaching that it is necessary for our students to measure up to a higher standard of preliminary educational requirements to comprehend the various laboratory work imposed upon them by the advanced curriculum, and that this advanced curriculum shall be so specialized and crystallized around dentistry that they will see the bearing of each fact when presented in the various laboratories, and grasp its significance and bearing as related to dentistry. This constitutes no curtailment of their studies, but makes those studies dentistry and not general medicine; and it rests with the profession to accomplish this, by the selection of their students of such colleges as have the facilities and show an honest endeavor to keep their promises made in their announcements.

Let the education of a dental student be a flight of stairs composed of dental facts, and let no fact be presented to him in his study which he is unable to comprehend in its relation to dentistry; and weed from his mental garden all facts whose relation to that science cannot be made manifest and apparent to him. It is the young man going out into the field of dentistry to whom the profession looks for the discoveries and advancement of dental science, and can we expect fruit different from the seed planted in his mind? So let us aim to bestow upon him such knowledge as will be a fair consideration for the money he expends and which will produce a lasting honor to our profession.—*Dental Cosmos, Oct. 1897.*

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OPERATIVE AND PROSTHETIC POINTERS. It not infrequently happens that the operator accidentally applies carbolic acid to the lips of his patient, and unless he is able to relieve the immediate suffering and the eschar which invariably results, he is likely to bring upon himself the unpleasant phrase of, "He is a careless, hustling dentist." Now if you have had the misfortune of getting

the carbolic acid in touch with the lips, you can avoid all difficulties by bathing the burned surface with vinegar and all unpleasant after effects will be avoided.

Resorcin may be employed as a local anesthetic. Resorcin, as we all know, has the properties of an antiseptic, since it is a derivative of carbolic acid and possesses many of the powers of the latter. Its qualities as a local anesthetic, however, are of considerable interest. In cases of stomatitis there is great need for such a remedy, and the mucous membrane can be painted with a mixture of resorcin 5 parts, water 30 parts. On account of its less irritating properties, it is considered one of the best antiseptic agents to be employed in the oral cavity. In diphtheria or other diseases causing a sloughing sore, no better results can be had than applying a mixture of resorcin to the affected portion. It accomplishes all that can be expected of carbolic acid and does it in a painless manner. For dental ulcerations it can be used in the form of a liquid; in case it is to be used as a dressing for wounds it should be used in crystal form.

As a substitute for cocain, Prof. Einhorn and Dr. Heinz, of Munich, have discovered a new chemical combination, having the desired effects of cocain minus the toxic results so frequently met with. They have named their agency "Orthoform," and great properties have been claimed for the new local anesthetic. It is a non-poisonous white powder, and has the power to completely anesthetize all nerve filaments with which it comes in contact. It has been used successfully in lancing boils and also in minor surgical cases. The powder is placed under the skin or membrane, and after the lapse of a few moments complete anesthesia takes place. The doctors intend to give further attention to this drug and expect soon to place it on the market.—Translated by Dr. B. J. Cigrand, from *Zahnartzliches Wochenblatt, Aug.-Sept. 1897.*

* * *

GUTTA-PERCHA AS A RETAINER OF CROWNS AND BRIDGES. Every practitioner should be prepared to attain definite and satisfactory results in the setting of post-crowns and bridges. It not infrequently occurs that the operator is obliged to remove a recently positioned crown or bridge; this undesirable operation is usually caused by pericemental troubles or possibly apical disturbances, and all practitioners are familiar with the hard task of eliminating the cement which is generally employed as a retainer. In repairing

bridges we are also obliged to remove the entire bridge, and the displeasure to both patient and operator is well known. But if the crown or bridge be retained by gutta-percha the removal need not give us trouble since, if we grasp the crown or pillar of the bridge with a hot forcep, the heat of the latter is readily conveyed to the gutta-percha, which, yielding to the warmth, admits of an easy detachment of the denture. In positioning a crown having gutta-percha as a retainer, it is wise to inquire of the patient whether any pain was felt; if so, the gutta-percha closely filling the root-canal has forced air through the apical foramen and this has induced the pain. Be certain to have but a sparing amount of gutta-percha on the post, and ascertain the exact amount by previous trial and trimming. Not only have we by this method accomplished retention of the bridge, but we have anchored it with a substance which is not acted upon by the dirt or fluids of the mouth.—Translated by Dr. B. J. Cigrand from *Zahnartzliches Wochenblatt, Oct. 1897.*

* * *

FREQUENCY OF DENTAL CARIES IN CHILDREN. Dr. M. Lipschitz, of Berlin, gave a most interesting paper on the above subject before the recent Congress at Moscow. It demonstrates as no paper of the past has, that dental caries is a disease frequently met with in the youthful population of Europe; it establishes the fact that this human ailment is abroad and that the impression that "in Europe the people have little difficulty with dental caries" is wrong. Among other things he says: "The great scope of dental caries is well known to the dental operator, but it is within the last few years that anything has been done to found our knowledge of this matter on statistics. In order to ascertain whether or not the frequency of dental caries is deserving of national attention, it was necessary to demonstrate by means of reliable statistics that the human economy is heir to no greater disease than dental caries. It was suggested and put into effect that a systematic investigation of the condition of the teeth of school-children be inaugurated, the investigation to be conducted in the several large cities of Germany, and if possible to extend to foreign lands.

In 1891, as near as can be determined, the first report relative to dental caries among school children was put into print. In Lucern, Switzerland, 1,000 children, ranging from 7 to 14 years of age, showed 94 per cent suffering from caries. In Germany Herr

Feuchel in 1893 examined 335 pupils with this result: 12 presented perfect dentures; 200 boys 97 per cent decayed teeth, 135 girls 95 per cent. These figures were gotten at the poorhouse at Hamburg, and the results of his investigation led him to probe into the condition of teeth at schools and academies which had pupils from more hygienic quarters. Among 693 children, 98 per cent of the girls presented decayed teeth and 99 per cent of the boys.

Roese, who gave even greater attention to this matter, published the following from the schools of Freiburg: Among 3,460 children, 98.7 per cent suffered from dental caries; and from neighboring towns 747 children showed 98 per cent.

Berten observed among 3,347 gathered from 21 villages that the boys suffered less than the girls, the former 81.3 per cent, the latter 84.6 per cent. He examined 78,348 teeth, and of this number 15.3 per cent were decayed.

In Ungarn Herr Unghvari noted 87.2 per cent of 1,000 children afflicted with dental caries, and in 3,961 teeth 15.4 per cent were decayed.

In England the British Dental Association under the direction of Dr. George Cunningham examined 10,517 mouths, presenting 76.78 per cent to 94.5 per cent. At one time after examining 40,000 teeth 4 were found with fillings; at another time 100,000 presented 237 fillings.

In Sweden under the direction of Foeberg (1897), in 1,617 children 97.2 per cent had decayed teeth. In the Masonic Orphans' Home 117 children showed 93.1 per cent afflicted with dental caries.

My (Lipschitz) own observations among 407 children (girls) of one of the Berlin schools gave the following results: 339 suffered from dental caries. I am of the opinion that great good will come from these investigations, and I would advocate that dental societies throughout the civilized world give this matter consideration and make reports of discoveries.—Trans. by Dr. B. J. Cigrand from *Deutche Monatsschrift fuer Zahnheilkunde, Oct. 1897.*

A NEW PHENOMENON OBSERVED IN FACIAL PERIPHERAL PARALYSIS is reported by Bordier and Frenkel in the *Semaine Medicale* of September 8. The subject affected with severe peripheral facial paralysis is unable to close his eyes when requested, without turning the eyeball of the side involved upward and slightly outward. This sign indicates the gravity of the prognosis, and the progress toward recovery as it gradually disappears.

Letters.

IS IT ETHICAL?

NEW YORK, Dec. 17, 1897.

To the Editor of the Dental Digest,

MY DEAR SIR:—I am constrained to write you on what I think might properly be called a question of ethics.

Recently one of my patients, looking over a copy of the *Items of Interest*, chanced upon the elaborate illustrations of a certain dental office. After reading it she exclaimed, "Is not that rather close to advertising?" I had not thought of it in that light before, but looked upon it as one of the new ideas in "new" dental journalism.

My patient, however, went on to say—what a brother practitioner subsequently put in other words—that some patients, seeing these journals on our tables and reading such articles, would compare surroundings, and that as a result of such comparison they would be led to go to some of those whose offices were thus exploited, on the ground that because of the elaborate outfit they must, of necessity, be the better dentists. My patient seemed to think that many people would be thus influenced, and I have heard more than one brother practitioner express the same thought. I am undecided on that score.

I have rather enjoyed looking over these articles, especially as I am acquainted with some of the gentlemen and know personally how nice their offices are, and the thought that this was advertising had not entered my head. I can readily see how one could boom himself by obtaining a quantity of the journals and sending them to his patients, without having overstepped the letter of the code, and we all know that there are many who would do so.

There is another side to this matter, however, which seems to me to call for attention much more than the possible advertising. There are many good men—fine operators, dentists in every sense of the word, careful and conscientious—who by reason of many things have not such fine offices. Some do not care to, more cannot afford to. The latter class may have large families to support, requiring close attention to business. Only the few can have the millionaire patients and obtain royal fees; the majority must be content with moderate fees, and are not able to put as much into office display.

Is it good taste to publish such articles, which at once bring out in bold relief all the little differences between offices? Does it promote brotherly feeling to cause a sigh of regret, discontent, what you will, on the part of the less fortunate practitioner?

Where shall the line be drawn between thus publicly attracting attention, even though it be in a dental journal, and the "animated" picture of a "dental parlor" in the windows of the large department stores? It strikes me that it's a rather close shave.

Yours, etc., CHEVALIER.

PHILADELPHIA LETTER.

Dear Digest: PHILADELPHIA, Dec. 13, 1897.

Philadelphia dentists think a great deal of your monthly visits, both for the wholesome effects of the same, and owing to the high personal regard we have for your editor. Many members of our profession are just beginning to realize how much they owe to Dr. Crouse, and there are several thousand more whom we trust will soon awaken to the duties of the hour.

Many of us here have been interested in the war of words carried on through your pages for a few months past between "Quaker" and a certain young editor. Quaker seemed to have disposed of him quite effectually in his last letter. Now the aforesaid editor we learn is taking his own medicine—the Famous Vegetable Compound —and we are happy to report that he is convalescing.

"New York" in his November communication says: "We suggest that he (the aforesaid editor) study and give the proper range to his editorials." While this may be all right, yet we would respectfully inform "New York" that our man has a good nurse and, it is thought, is now out of danger, so we would direct his attention to the appearance of the same malady in his own city. At least a commission of experts have recently reported that New York was taking care of a similar case, and in a young editor very like our own. The most prominent symptom of this trouble is that the patient is controlled by the idea that on him lies the responsibility of moving the whole world. This is a terrible thought, and from the fact that it necessitates such early rising to get things going, the poor soul is soon weighed down by it. It is assumed that this is purely a mental derangement, as no germs have yet been discovered or isolated which will produce the condition, so the vegetable compound

we think as good a treatment as could be followed, and it is perfectly harmless.

We are particularly interested in the matter touched upon by "Quaker Jr." in your last issue. He makes a plea for a higher moral standard in the profession, and thinks this matter should be taken up by the Association of College Faculties. The ideal dental college would be one where not only a thoroughly practical course should be taught, and where all the influences thrown about the students should be for good, and a greater interest shown in the moral development of the coming practitioners, but where students should not be accepted unless they brought with them a letter from some member of the profession in good standing, preferably an alumnus of the college in question, certifying to the *moral character* and personal qualifications of the applicant.

What we are sadly in need of is more good, sound common sense and less law. We are really getting loaded down with *law*. It is law here and law there, and what does it all amount to? We are having immoral and incompetent men graduated as in the earlier days, and even have to submit in certain states to boards of examiners (so called), who look forward to their semi-annual meetings as an opportunity for a good time, some of which are disgraceful affairs, but they are created and supported by law. We should be glad to hear from your editor along these lines.

We hear that the last meeting of the Odontological Society was one of much interest. The subject of the evening, "Dental Caries," was discussed by Drs. C. N. Peirce, Edw. T. Darby, Libby of Pittsburgh, Kratzer of Reading, Jeffries of Wilmington, and others. Prof. Peirce's remarks were illustrated by a lantern exhibit, and Prof. Darby spoke at some length concerning the predisposing systemic causes of this universal disorder which we are all combatting.

We were very glad that you called upon the editor of the *Items of Interest* for information. These are points that he should make clear to us, and in the future he will, we hope, be careful not to leave us in this uncertain position.

That "Fellowship" alloy works beautifully, and we have no doubt will prove all that is claimed for it. We are putting it in alongside of other amalgams and making memoranda of the fact. Time will tell. We have long needed a perfect amalgam and we feel very much encouraged since experimenting with "Fellowship."

One of the finest dental libraries within our knowledge is that possessed by the Academy of Stomatology of this city. The shelves are not only well filled with all of the modern dental literature, but we find copies of many rare and valuable works. It is in charge of a most excellent librarian, Dr. William H. Trueman, and any one wishing to donate any works of interest or value may write to this gentleman.

Prof. James Truman is ill and has just met with a serious loss in the death of his son. Here is one of the great men in the dental world, stricken physically and sorely at heart, and we are all touched by it. Our sincere sympathy goes out to the doctor and she who has been his companion and helpmate for so many years.

Yours cordially and for a successful New Year,

QUAKER 3D.

LETTER FROM CANADA.

To the Editor of the Digest, MONTREAL, Dec. 15, 1897.

DEAR MR. EDITOR:—In our last letter we promised to speak of the course of study preliminary to practice in this province. The course is three full years and it is first necessary to pass the matriculation examination, which consists of the following subjects:

Latin—Cæsar's Commentaries, Book I, with Virgil's Aneid, Book I. Questions of Grammar and Construction. *English*—Writing from Dictation. Grammar and Analysis. A critical knowledge of one of Shakespeare's Plays. Macbeth, 1897. *French*—Translation into English of extracts from Fenelon's "Adventures de Telemaque." Questions of Grammar. *Literature*—Elements of the subject, with the History of English Literature from the reign of Queen Elizabeth to the present time. *History*—Britain, France, Canada. *Geography*—Modern, especially of Britain and France, and of their Colonies and Possessions. *Arithmetic*—To the end of Square Root, and to include a knowledge of the Metrical System. *Algebra*—To Simultaneous Equations of the first degree, inclusive. *Geometry*—Euclid, Books I, II, III, and the first twenty Propositions of Book VI; also the measurement of the Surfaces and Volumes of the regular geometrical figures.

Note.—The above subjects are obligatory. In addition to them, candidates must choose one of the two following: *Philosophy*—Logic, and Intellectual and Moral Philosophy. *Physics*—Elementary Statics and Dynamics of Solids and Fluids, with the Chapter on Heat. *Botany and Primary Chemistry* will be added next year.

The examination fee is $20. Should the candidate pass the examination he must then indenture with a practicing licentiate for three years, after which he registers his indentures with the secretary of

Dr. P. Brown has returned from Virginia much improved in health and has resumed his practice.

Dr. Alexander Hyndman, of Sherbrooke, registrar of the dental board, and the most popular member of that body, died last week from pneumonia; he had been ailing for some time.

Fraternally. MONTREAL.

BALTIMORE LETTER.

Dear Digest: BALTIMORE, Nov. 15, 1897.

The echoes of my last gutteral notes had scarcely died away, when I received yours saying you were again going to press. What a ceaseless thing protection machinery is, to be sure; what restless, nimble, watch-dog, high tariff sort of hooks you do send out to exact tribute even of a lazy southerner, who in his most ardent days of courtship could write to his sweetheart only once or twice a year. You western owls, who toot and whoop all night, display a culpable indifference to our seasons of repose. After all, climate is a wonderful thing, and to judge by a recent editorial in the *International*, page 835, sectionalism will never die.

It seems to Oriole particularly unfortunate that an outsider should have been the first to call public attention to the fact that the president of the *late* Southern Dental Association has been guilty of some absurdities in his call for the next meeting at St. Augustine in February. In the first place there is no longer any Southern Dental Association; that name was lost in the amalgamation with the American, and at the last meeting of the Southern it was unanimously resolved that hereafter its name should be "The Southern Branch of the National Dental Association." The retention of the old name in the face of this unanimous action has the appearance, to say the least, of bad faith; but I prefer to consider this, as well as the snobbishness displayed in the call to arms by the president, as the result of his personal bad judgment. I do not believe that the rank and file of the members of this old and honorable association will approve either of misrepresentation or jingoism.

There can be no denial of the fact that as a local society there is a good field of usefulness for this organization; but that the men of this section should be content to flock together in a sectional and selfish manner, consenting at the same time that the national association, with which they have no affiliation, has supreme authority

the dental board, the fee for said registration being $10. We might also add that the licentiate generally charges the student a fee ranging from $300 up for the privilege of indenturing with him. It is also necessary for the student to attend three six months' terms at the college, the fee for which is $105 a term. Notwithstanding the steady advance in the standard of matriculation, and the large amount (for the average student) required to complete the course, the number of students is increasing every year and the standard of the men entering is very high; a good omen for the future of dentistry in this province.

A proof of their high standard was given at the last primary medical examination, i. e., the first and second years, for they carried off all the prizes it was possible for them to win; this was rather hard on the poor radicals, but goes to prove the benefits of a high standard of matriculation.

In a future letter on our position in the social scale, the benefits of a first-class preliminary education will be further exemplified.

Gold plates seem to be coming more into vogue again; many prefer them to bridges on account of their greater cleanliness.

Dr. J. S. Marshall of your city should feel quite pleased, as a number of the members of the faculty of the dental college have adopted his suggestion in the August DIGEST, and are lecturing, or rather reading from the text-books. It remains to be seen whether this system will prove better than the one in general use, viz, a compilation by the lecturer himself.

We saw an oddity (for Montreal) lately, a man with diamonds inserted in his teeth. It is a pity he went to your city to have the work done, as he could have found men here willing to do such work, and he would probably have saved money, as we believe the duty on diamonds coming into this country is lower than the United States tariff rate, but perhaps he took the diamonds with him. Gold crowns on front teeth, diamonds, what next? Vulgar vanity seems to have a strong hold on a proportion of the citizens of this country, and love of dollars seems to have too strong a hold on a certain number of the members of our profession.

In reading Dr. Mills' obituary of Dr. Evans, we notice he states that at the time of his death he occupied the office of dentist to the royal families of England. We were always under the impression that Sir Edwin Sanders held that position.

should have his license rescinded *by law*. Then, too, the National Association of Dental Examiners should not place on the list of reputables any college which does not confer its diploma conditionally: viz., if the graduate backslides in his morals or ethics the diploma reverts to the college.

Statements have come from New York that more legislation has been had there than in any other state, and still quackery is rampant, worse than ever, in fact. Now surely the New-Yorkers don't want to admit that the law is an impotent instrument to down quackery. Let them borrow our examining board, or maybe they could get the Virginia board; with either I'll warrant that Colonel Waring wouldn't be a marker.

We see that the Northern Illinois Society is petitioning for uniformity in the dental laws. The "National" appointed a committee to encourage this and the sentiment is already popular in some quarters, but not in Maryland or Virginia.

Our plucked candidate here proposes to air his diploma and certificates in court; we'll let you know how he works out. We must confess to a loss of interest in the young man; it is such a vulgar thing, even though one is starving, to consent to be unethical for a little money. Pity our profession can't organize a Y. M. C. A. for these stragglers; some of them might be reclaimed. Either this or build a picket fence all around our town so they can't get in.

The Washington City and Virginia and Maryland state societies will hold a union meeting in Baltimore early in June. Come down and partake of our hospitality. You'll find the Maryland men (examiners included) royal good fellows and glad to see you and other western brethren. Cordially, ORIOLE.

LETTER FROM THE NORTHWEST.

DULUTH, MINN., Dec. 18, 1897.

To the Editor of the Dental Digest,

MY DEAR MR. EDITOR:—My first thought in answer to your request for a letter is a wish for editor and readers, in harmony with all that is happy and joyous, full of the message of the season—"Peace on earth, good will to men;" and following closely, as echo follows sound, with just a shade of mockery, comes the second thought, what of this good will among the members of the dental profession, and is there any peace on earth for him who toils up-

in matters professional, is incompatible with my ideas of the progressive and ambitious character of the men foremost in this organization. Not only this, but it is entirely out of sympathy with the generous plan of organization of the national association that this large section should be ignored or ostracised, even by its own action or preference. The bare existence of such an intention or desire on the part of the southern men would have been fatal to the attempt to organize a national association. The hope and intention so unanimously expressed at Old Point was, that every section and every association should unite in this one central organization, the professional authority for the whole country; not that they should in a distant and vague way confer upon this organization all authority, but that they should heartily unite to develop in this country a central organization, whose cordial support from all sections would give it the authority essential to usefulness in such a body.

I believe this to have been the intention and that this will be the ultimate result, in spite of croakers and pessimists. It cannot be supposed that this "consummation devoutly to be wished" will take place immediately, at the snap of the fingers of a "Heller," but that under the guidance and suggestion of its officers it will—not without difficulties and misunderstandings—ultimately develop. Once firmly organized and in good working order, this organization can bring order out of the chaos which exists in many quarters of our professional household. So join the push and help her along: "Play my way or not at all" won't do for men, and "surely we are all (honorable) men."

The young graduate of the Ohio Dental College and the possessor of several certificates from western states has met his Waterloo. The Maryland State Board of Dental Examiners have examined him and he flunked. Now there must be something rotten in your western educational and examining methods, or surely a man couldn't get a diploma from the second oldest dental college, and the right to practice after successful examinations from several states, and finally fail before the examiners in modest little Maryland. The fact that the young man had accepted employment from a "Cheap John" could not possibly have prejudiced his case, for a careful wording of our law makes no possible allowance for such action; class legislation is no more popular here than with you. The new law should be more explicit. Any man who advertises platina fillings at 75 cents

Minneapolis, but the fact remains that this Minneapolitan has many times shown new methods that others have claimed later.

There is an ominous silence from the southern part of the state that can mean nothing but a coup of some sort. Those Southern Minnesota Dental Society fellows are never quiet and, like the Indian, are most active when least in evidence. Merrill, Robinson, Cruttenden, Stearns, and all your associate good workers, vertebra of Minnesota's organizations, we wonder what you are brewing now?

The Odontological Society of Milwaukee, of limited membership, after the manner of its Chicago parent, was organized a year ago and is reported to be right in line and doing good work. A happy state of prosperity and good fellowship among its members was fully in evidence at a recent dinner at the Plankinton. Dr. Peck, of Chicago, is to read a paper at their next meeting. The Odontologicals will be heard from; count on it.

Milwaukee has another, the Milwaukee Dental Society, newly organized and more general in its membership. Success to them all.

The Milwaukee School of Dentistry, which has recently been admitted to the Faculties' Association, has an attendance this season of ninety, with a graduating class of about twenty.

It may not be generally known that Dr. Enos, a practitioner here a number of years ago, was a nephew of the late Dr. Evans.

Dr. McCausey, of Janesville, is in line for double congratulation, having recently married and taken the chair of Dental Pathology in the Dental Department of the Milwaukee Medical College. His friends are all pleased at the opportunity.

Dr. Chittenden, of Madison, is supposed to be busy making ready for the next meeting of the Wisconsin State Dental Society, to be held in that city.

It was recently my privilege, as a member of a committee appointed by the Section of Stomatology of the American Medical Association, to examine some forty or more patients in the office of Dr. W. G. A. Bonwill in Philadelphia, many of whose mouths had been in his charge for twenty odd years, some few longer than thirty, and it is of interest to note, in view of current discussion of stress and flow, of shrinking amalgam fillings, of proposed square-shaped, straight-sided cavities, and other radical changes, that all this vast quantity of work seemed to be without exception in perfect condition, although, beyond occasional examination, the patients

ward fast bound to the ball and chain of bread-winning serfdom, perhaps lashed at every step by the cat of his mercilesss task-master, ambition? Yet I remember with encouragement that the dentists of America have learned that they can successfully cooperate against their old-time enemy and oppressor, the patent-rights fiend corporation. Why not join hands against old Father Time and his steadily moving scythe? By small annual payments or assessments for death of members, or even for each member passing beyond the age limit, or being permanently disabled, something could be provided not only for widows and orphans, as by other similar organizations (surely this would be quite as complimentary as reports of committees "in memoriam"), but also for those whom death has not claimed, but who often need protection even more as they struggle on to the far end of the journey, with eyes growing dim and hands less true and steady; their voices losing fast the power and magnetism with which to hold an audience; unable to keep the pace set by younger men, and passed by and forsaken by an ever-fickle public. Aye, and often forsaken by the institutions that have fattened upon the fruit of their life's researches and attainments, gathered and freely given in the very fullness of ripening maturity. Brother Crouse, the eyes of the dental world are upon you. Will you undertake another task and show how much more men can accomplish with minds assured for their own future and the welfare of those they love?

The coming meeting of the National School of Dental Technics seems to be the most prominent feature of general interest at the moment, and Stepfather Cattell is sounding the tocsin for a great gathering of the clans. In this connection it is with pardonable pride that the Northwest calls attention to the fact that advance sheets recently distributed promise some very good things from Weeks, the center rush of Minnesota.

Dr. Davenport, of Moorhead, leaves the Minnesota State Board of Dental Examiners this year, after long and able service. He will be missed.

They do say that Dr. C. M. Bailey, of Minneapolis, is guilelessly innocent of the fact that a year hence he will be expected to use his long experience in college work to help him as a member of the examining board.

It is some little time since anyone has published as his own one of Dr. St. John's ideas. You might not expect such modesty in

assured me, but little had been done since the fillings were inserted. Contours, plus-contours, interproximate spaces were alike preserved, and curious as it may seem, gold and amalgam stood side by side, the one doing service quite as perfectly as the other. It gives me pleasure to pay tribute to the genius that has wrought this living record of thirty-five years of usefulness, and the lesson as I read it bids us not to lose sight, in the theoretical study of methods and principles, of that practical *something* which made this possible.

In conclusion, Mr. Editor, I am embarrassed. The November DIGEST is before me, full of interesting matter most entertainingly discussed by "Cincinnati," "Cleveland," "Quaker, Jr.," "Montreal," "New York," and the familiar notes of "Oriole." Shall I follow these into the popular highway of nom-de-plume and sign myself "Old Man Afraid of His Horses," or adopt some other title equally familiar to Northwestern Territory?

It is apparent that the freedom with which your writers express themselves, and the diversity of interests they represent, are undoubtedly powerful levers in the profession to-day. Yet, having in mind the confusion arising from evergreen discussions between friend "Quaker" and his well-known adversary, I wonder whether after all the use of proper names would really tend to restrain a proper freedom of expression; and so pleading guilty to old-fashioned ideas, for the present I remain, without the plural pronoun of royalty and editorial custom, without even my "alter ego," just the same old shade of

BROWN, GEO. V. I.

NEW YORK LETTER.

To the Editor of the Digest, NEW YORK, Dec. 21, 1897.

MR. EDITOR:—We think we do not err in noticing from time to time the various articles published in the journals. Some are commendatory and others are not.

We see in the November *Review* that Dr. Geo. T. Carpenter fails to notice that others have experimented and written in the direction he has. Drs. Atkinson and Rynear both worked along the same line and with similar results.

Dr. Perry has an emphatic article for more artistic work with artificial teeth. We commend his earnestness, for he at least seems to believe what he writes. There is much truth in what he says about turning over all plate work to laboratory men.

One writer is very honest. In closing an excellent article on tooth-bleaching, he says there are many more things he would like to explain, but the truth is, he does not understand them himself. Pity more are not so frank. As Dr. Cattell says in his article on the "Etiology of Decay," we know a few things and are ignorant of many more.

Great curiosity is aroused to learn who is "the one dentist who represents the highest type of the professional man" in New York. Why not publish his photograph? We think some of the criticisms in the *Items of Interest* of Dr. Jack's writings are weak, yes even silly, such as saying that it should be considered malpractice to do anything to any tooth without first adjusting the rubber-dam; and that oxychlorid of zinc always is a menace to the life of the pulp.

The editorial in the above journal on "Quacks" shows great ability. We await the formation of a state association which shall formulate an article to be published in all the newspapers of the country for the education of the public. The identity of those back of this is to be kept profoundly secret. The danger would be that in some way or other these men would be found out. One of the gentry described in the editorial achieved a little cheap notoriety recently by striking a millionaire over the head with a champagne bottle.

Dr. M. L. Thompson, a prominent dentist of Brooklyn, died yesterday from heart disease. He was born in Pittsfield, Mass., and had lived in Brooklyn nearly forty years. When we came to Brooklyn in 1861 we had Dr. Thompson as an assistant for four years. He was of a rather inventive turn of mind, and brought out some profitable inventions.

The death is announced at Hamilton, Bermuda, of Dr. Wm. C. Horne. A native of the West Indies, he came early to New York, where he achieved prominence in the dental profession, being one of the founders of the Odontological Society. He afterwards practiced several years in Paris and in Rome. Later in life he built up a practice in various islands of the West Indies and in the South American states. From 1862 Dr. Horne was an active participant in all our society movements. He made more than ordinary repute for himself and the society of which he was recording secretary—the Brooklyn Dental Association, which from 1862 to 1870 took an active part in dental doings.

The following is from November number of the *Pacific Stomatological Gazette:* "Dr. Thomas Evans has a unique method of retarding the setting of cements while mixing. He takes an ordinary bottle filled with ice water, places a small quantity of cement and liquid on the bottle and stirs it, and the cold retards it; then when placed in a warm cavity it sets rapidly. He uses cement entirely in the anterior teeth. He fills the teeth and instructs the patient to return in six months. He does not consider that he is doing permanent work in the filling line, but argues that he saves the teeth, and must see the patient in six months." We would add that not infrequently the use of gutta-percha at the cervical edge will prevent the recurrence of decay from the cement dissolving away.

A wonder is going the rounds of the city press, in connection with the discoveries of prehistoric people in the mounds of Mexico, which is, that pearls are found in the teeth. Dentists could explain that they are merely pulp stones.

This reminds us; who originated the term "pulp," which is very suggestive? If we are not mistaken, it is due to Dr. A. L. Northrop, of this city. It used to be "nerve." We can now see that nerve meant only a portion of what was contained in the bony chamber of the tooth.

We wish to correct an error in our last letter. We did not mean to imply that the operation in question was the first time Dr. Atkinson used a mallet, but that it was the first time we had seen it used.

The last *Dominion Dental Journal* contained a very simple but serviceable hint—wet a slack engine cord to tighten it. We have practiced this hundreds of times, yet we did not think to tell of it. It is the little things that help, so speak them out. A simple but very useful procedure is this—put a mandrel in the handpiece, set the engine in motion and let the mandrel wind on a piece of cotton from the fingers, which forms a cotton cone. Then with the aid of polishing powders we can cleanse the crowns and necks of teeth and get into the pockets and loosened gum tissue, smoothing the rough surfaces of the exposed roots and doing it in a merciful way. The size of the cone will suggest itself to the operator.

The several expressions of opinion in the International afford an abundance of reading and much opportunity for thought, and reading should come before thought. We were a little puzzled as to what those criticizing were aiming at, but while reading Dr. Max-

field's article the line of reasoning began to dawn upon us. We assume that Drs. Black and Williams are right in their views concerning the physical characteristics of teeth. This subject can be viewed only from the standpoint of nutrition. The system may become weakened by overwork, and the enfeebled organs fail to do the work necessary for furnishing nutrition. We see the same defect occurring in the organic structure of the teeth as we do in any other part of the body. Malnutrition does occur in the organic structure of the tooth just as in the soft tissues. Finally, no one has ever been able to give an analysis of the basal subject known to be in all organized tissue. Peter Cooper made millions out of his glue, but he never knew of what it was composed. We can know only phases of truth; truth itself is undefinable.

In our next letter we shall give the readers of the DIGEST a synopsis of Dr. Nash's book. We would say in advance that it is worthy of careful attention. The book shows great industry in minute detail, and deals with the hackneyed subject of pyorrhea alveolaris very intelligently.

The First District Dental Society at its December meeting listened to an admirable paper, "Immediate and Remote Cause of the Malformation of the Dental Arch," by Prof. Dwight L. Hubbard. On the program was this statement—"The A. L. Northrop Dental Library is now open to the profession."

The officers of the Odontological Society for 1898 are: S. G. Perry, Pres.; J. B. Littig, Vice-Pres.; Eugene Palmer, Rec. Sec'y; Dr. Walker, Treasurer; Dr. Parker, Editor.

The Stomatologicals will have their annual banquet Jan. 14, at Delmonico's. Drs. Peirce, Jack and Truman, from Philadelphia, and Seth Low, president of Columbia College, will be present.

Cordially, NEW YORK.

TO STUDY THE DENTAL SCHOOLS OF THE UNITED STATES.—Dr. P. Gires has been officially commissioned by the French government (July 31) to visit this country and study the workings of our dental colleges.—*Gaz. Med. de Paris, Aug. 21.*

COUNTING BLOOD CORPUSCLES.—An instrument for counting blood corpuscles has been invented by Dr. Judson Deland, of Philadelphia. A finely graduated tube containing a quantity of blood is revolved at a speed of one thousand revolutions a minute. By force of gravity the corpuscles divide and form on the side of the tube in easily traceable divisions of red corpuscles, white corpuscles and serum.

The Dental Digest.

PUBLISHED THE
TWENTY-EIGHTH DAY OF EVERY MONTH.

Editorial.

A HAPPY NEW YEAR.

How can we get the greatest amount of pleasure from life the coming year? By doing some good in the world. The profession of dentistry is an almost unlimited field, and there is such a multitude of ways in which one practitioner can help and do a good turn to his neighbor, that there can be no excuse for anyone failing in this regard. Any little service done to your fellow practitioners will promote good feeling and increase your own happiness. Surely more friendly intercourse is as much needed as anything in our profession.

Busy yourself in some useful way. If nothing else occurs to you, the pages of the DIGEST are always open, and we shall be glad to receive anything which you think would be of interest to the profession. A little time given in this way will surely add to your own happiness and be warmly appreciated by those who read the result of your labor and thoughtfulness.

NATIONAL SCHOOL OF DENTAL TECHNICS.

This association is now meeting in Chicago, and we shall give a full report of its proceedings in the next issue of the DIGEST. The members of this organization are striving for a higher standard and more uniform and systematic work in many directions, and they deserve to have their efforts crowned with success.

The evening of December 29 Dr. Black read a very exhaustive paper on Instrument Nomenclature and Measurement. His plan is to do away with the great variety of forms of instruments now in use and adopt a uniform system of names and shapes. While no great change can probably be made with the present generation of dentists, the students now entering the profession will be able to adopt his methods. In this connection we would add, that we hope one result of his labors will be to train the students in a more general use of instruments. Excavators are used too little in the colleges, most of the work being done with a bur in the engine.

CLOSE OF OUR THIRD VOLUME.

This issue completes the third volume of the DIGEST. During the last year this journal has grown in many ways. It has sixteen more reading and sixteen more advertising pages, and the number of its subscribers has been increased one-third. Very few have ordered the journal discontinued for 1898, so we feel assured that the profession are pleased with the DIGEST and that it fills its place. We have received much help and many letters of encouragement during the past year from the profession, and we solicit a continuance of the same.

Our aim throughout has been, and still will be, to make this journal a little different from any other journal; to make it interesting and spicy; to keep it abreast of the times; and above all, to give it an individuality. The DIGEST is under no obligation to any unlawful trust or combination, and is not controlled by any dental supply house. For this reason we can truthfully say, that it is the only independent dental journal published in which any subject of interest to the profession can be discussed without fear or favor. Perhaps this is one reason why it has more paid subscribers than any other dental journal published.

Thanking one and all for their assistance during the hard times of the past year, and hoping that, with a brighter prospect before us all, others will give us their aid, we close our third volume with best wishes for the new year.

THIS MONTH'S ARTICLES.

The device described by Dr. Heckard is very simple but effective. It would increase the interest in our dental literature if more would send these helpful little items.

The article on "Dental Colleges" by Dr. Allwine expresses the idea which is entertained by the thinking part of our profession to-day—that the students should be better educated before entering college. The fault does not lie so much with the teachers and their methods, but in the material upon which they have to work.

Cataphoresis is admirably dealt with by Dr. Holbrook. This subject has been reviewed so many times that it is a pleasure to find an article which is not merely a rehash of what others have written. The Doctor gives several new and valuable points which are worthy of consideration.

Dr. Talbot emphasizes the importance of prophylaxis of the mouth in its bearing upon the general health, and recommends various forms of treatment.

We would call special attention to the article on "Soft Foil," by Dr. Chittenden, as it treats of a plan of filling which in many respects has no equal. He describes its use in ribbon form, but cylinders of the proper length, wedged into the cavity, save an immense amount of time and packing and make a very safe and durable filling. To start with non-cohesive and finish with cohesive foil often makes a better filling than one made with cohesive foil alone. Non-cohesive gold foil has become an almost unknown article in dental operations, and it is a deplorable fact, not only because the profession are deprived of a useful adjunct, but also because the use of instruments with hand pressure gives the operator more manipulative ability than do the engine and mallet.

The letters as usual contain much interesting news. A perusal of the letter from Canada leads us to believe that the examination for admission into the Canadian colleges is more severe than our own here in the states. The letter by "Chevalier," who is one of the best known and most respected dentists in this country, will probably arouse much discussion, and that is undoubtedly his purpose in writing. The gentlemen who send these monthly letters take time from a busy life to do so, and we are pleased to note that the profession appreciate their self-sacrifice, as evinced by many complimentary letters concerning this department which we have received.

Notices.

RESOLUTIONS PASSED BY CHICAGO DENTAL SOCIETY, OCT. 5, 1897.

Again we are called upon to record the name of a distinguished American dentist among those whose life work is finished, and whose achievements form a conspicuous part of the history of dentistry the last quarter of a century.

The life of Dr. Frank Abbott was one of great worth to dentistry in America. During a period of about thirty years he was at the head of the New York College of Dentistry, and with this institution, one of the foremost in our country, his name will ever be inseparable. Dr. Abbott was honored by election to the presidency of the American Dental Association, the Association of Dental College Faculties and other bodies with which he was connected, and was recognized as a leading man in the profession.

Resolved, That in the death of Dr. Frank Abbott the dental profession has lost a member whose affability won him our friendship, and whose earnest efforts in advancing dentistry among practitioners and as an educator placed him among the foremost men in the profession.

Resolved, The Chicago Dental Society deeply regret the untimely death of Dr. Abbott and convey herewith our sympathy to his family in their bereavement.

Resolved, That a copy of these resolutions be spread upon our records and a copy be sent to the dental journals and to his family.

TRUMAN W. BROPHY,
J. H. WOOLLEY,
C. S. CASE,
} Committee.

Whereas, the change so rapidly taking place among the pioneers of our profession has been conspicuously marked in the death of Dr. L. G. Ingersoll, of Keokuk, Iowa.

Dr. Ingersoll was a leader in the profession and contributed largely to its literature. His standing as a man of broad education gave him a prominent place among educators and literary people, and commanded the attention of all audiences which he addressed. Dr. Ingersoll was not only a scholar, but he was an earnest worker and an eloquent speaker.

Resolved, That in the death of Dr. Ingersoll the profession has lost another distinguished member, whose life work was in the interest of a higher educational standard.

Resolved, That a copy of these resolutions be placed on the records of this society and published in the dental journals, and that a copy be forwarded to his family.

TRUMAN W. BROPHY,
J. H. WOOLLEY,
C. S. CASE,
} Committee.

LATEST DENTAL PATENTS.

593,777. Fumigator, Thomas H. McDonald, Potomac, Mont.
594,302. Inhaler, George B. Underwood, New York, N. Y.
594,543. Adjustable head rest, Charles A. Lee, Canastota, N. Y.
594,486. Dental appliance, Joseph E. Nichols, Rochester, N. H.
594,572. Arm rest, William M. Slavik, St. Louis, Mo.
594,952. Dental tool guard, Frank F. Hoyer, Owosac, Mich.
595,068. Dental appliance, William T. Lyon, Portland, Ore.
594,961. Depurator, Thomas N. McLean, Elizabeth, N. J., and C. B. McLean, Stamford, Conn.
595,532. Dental cuspidor, Dennis S. Doyle, assignor to W. W. Doyle, Philadelphia, Pa.
595,533. Dental cuspidor, Dennis S. Doyle, assignor to W. W. Doyle, Phila delphia, Pa.
595,301. Dental apparatus, Charles D. Grundy, Batley, England.

(List furnished by John A. Saul, Patent Attorney, Washington, D. C.)

RESOLUTIONS OF RESPECT.

Whereas, in the sudden death of Dr. E. V. McLeod, which occurred November 24 the Massachusetts Board of Registration in Dentistry has lost one of its original members, who during its existence of eleven years has served as secretary,

Resolved, That in the death of Dr. McLeod the board has sustained the loss of one who has been most efficient and faithful to its duties, giving an immense amount of time to its work.

Resolved, That as an examiner he displayed wisdom and discretion and wonderful tact in dealing with men.

Resolved, That in his contact with his associates on the board, his kindliness of nature and generosity of heart will always be remembered with the warmest affection.

Resolved, That we extend our sincere and heartfelt sympathy to his bereaved widow in this her great affliction.

Resolved, That these resolutions be entered on the records, and a copy be sent the widow of the deceased and to the several dental journals for publication. (Signed) JOHN F. DOWSLEY,
GEO. E. MITCHELL,
THOS. J. BARRETT,
DWIGHT M. CLAPP.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

(*Continued from page 759.*)

MONDAY, AUGUST 2, 1897—AFTERNOON SESSION.

The President called the meeting to order and the secretary called the roll.

Dr. Klump: I offer the following resolution:

Whereas, matters of importance both to the National Association of Dental Faculties and the National Association of Dental Examiners are liable to occur at the sessions and in the interim of the meetings; therefore, be it

Resolved, That the President annually appoint a committee of five and that we request the National Association of Dental Faculties to appoint a similar committee, these to act as a committee of conference for these associations to adjust all questions of difference that may arise or to prepare any business in which both associations are interested.

The above resolution was seconded.

Dr. Barlow: Is that a permanent committee?

Dr. Klump: A standing committee.

Dr. Barlow: I cannot see any reason for the formation of those committees. If they are formed the members will reside in all parts of the country and in all probability they can only have a session annually; if any occasion for such committees should arise they could be appointed at the time and for the time being.

The President: I am satisfied that some of the Association of Faculties and the President are in favor of a committee of that kind, so that, ad interim, matters might be presented to that committee for consultation at least—or to the chairman of the committee—and they might gain some information on the subject.

Dr. Klump: It seems to me that we have seen the importance of such a committee even at this meeting. Sometimes there are questions to adjust on short notice, and if there was a standing committee of this kind they could consider the matter for a long time before they got together even if they had

no meeting. If there were any vacancies in the committee when the sessions occurred they could be filled by appointment by the president, the same as any other committees. I do not see any harm that could come of it and I think there could be a good deal of good arise.

Dr. Dowsley: I am heartily in favor of the resolution, but I am afraid that a committee of five would be too large. I think a committee of three would be easier handled and more likely to get together.

Dr. Klump: I had some consultation with some of the members of the National Association of Faculties, and they thought it was a good idea and they were going to introduce a similar resolution there. If the committee is too large I have no objection to making a committee of three. The committee should be the same, however, as that of the Association of Faculties. I am willing to accept the amendment making the committee three, although I think it should be the same number as the Faculties' Association appoint.

Dr. Fredericks: I rise for information. Have we not a standing committee whose business it is to take care of these matters—the committee on colleges? Has not that committee certain rights and privileges; have they not the right to decide upon these matters and take these matters under advisement? If that be the case, I see no necessity for loading up our association with a lot of standing committees. Even if this committee were appointed the members would be from different states and it would be practically impossible for them to meet between the sessions. I cannot see any good which will come from having such a committee.

Dr. Donnally: In the Association of Faculties there is what they call an ad-interim committee and all questions that arise during the year are submitted to that committee of three and its decisions are binding until the next meeting of the association. A similar committee of this body, acting with that committee, to make and explain rules and so on and to confer with that committee and agree upon a condition that would obtain until the next session of this board, would save trouble and would act along the same line as the Faculties' Association in obtaining objects that are common to both organizations.

Dr. Klump: I suggest we make it a committee without naming the number, leaving that to the president—if the maker of the amendment will accept that.

The President: I understand that is accepted by the maker of the amendment. That resolution, Dr. Donnally, covers about the ideas which you have?

Dr. Donnally: Excepting that they have an ad-interim committee, and instead of requesting them to appoint a new committee I think we should ask them to authorize their ad-interim committee to confer and agree with this committee on any difficulty that might arise between the two organizations; that agreement to obtain until the next meeting of the two organizations when we would take it up, and we would take it up independently of the action of the committee except in so far as the time that has passed is concerned.

The President: The only difficulty is they have their committee already appointed.

Dr. Donnally: And we simply request them to authorize their committee to confer with ours.

The President: There would be no objection, I take it, to inserting that in the resolution.

Dr. Klump: There will be a similar resolution offered over there.

The President: I so understand it. Do you consider this resolution sufficient for our action?

Dr. Hatfield: Would it not be the part of wisdom to defer this until we have a report from the conference committee that is out?

The President: This committee does not supersede any action they may take.

Dr. Hatfield: I thought it might be to attend to the business which is at present unfinished.

Dr. Libby: The objections made by our friend from New Orleans I do not think enter into this case at all. The conference committees that have been appointed from year to year by this association have been working outside of the committee on colleges and I consider it a very necessary thing that this be one of our standing committees. The men then can be in consultation—they will know the work they have to do and will be better prepared to do the work than if they took it up at a time when some conference became necessary during the meetings of the association.

Dr. Moore: May I ask that the secretary read the resolutions instituting the committee on colleges and their duties?

Dr. Meeker: The only thing I can find is this, which appears in the proceedings at Saratoga last year: "In conclusion, your committee on colleges, in looking up the official records to ascertain exactly what their powers and duties were, found that no specifications whatever had been made and they would therefore suggest that the duties and powers of said committee be distinctly formulated." I have not the original resolution which instituted the committee on colleges, which was adopted at Saratoga I think the year after this association was formed. After Dr. Levy's death the books were lost together with nearly all the papers. Maybe Dr. Brown can tell us something about that.

Dr. Brown: Has there not been a committee appointed to codify the rules, constitution, by-laws, regulations and so forth? Until that committee can report and get things in intelligent shape I think it would only complicate matters to pass a resolution of this kind at the present time and I therefore move to lay this resolution on the table.

The motion to lay upon the table was seconded and carried by the following rising vote: 14 ayes, 13 nays.

The President: The conference committee I understand is ready to report.

Dr. Donnally: I would like to ask, for information, before I read the report, who constitute the committee on codification of rules, etc.?

The President: Drs. Meeker, Adams and Brown.

Dr. Donnally, chairman of the committee on conference, then presented a report which, after some discussion, was referred back to the committee for further consideration.

Dr. Wright: I have a matter here which seems to me to come within the province of this association. I do not know how many will agree with it, but I hope you will at least be entertained, if not amused by it. (Reading):

"For the evolution of or to develop dental science this, the nation's dental association, is hereby organized, and is composed of active and ex-presidents of all regular chartered state dental associations and societies, dental college faculties both active and retired, also active and retired state dental examining boards.

"Officers—A president, elected by this body; vice-presidents, one from each state or foreign nation, viz., the retiring president of each chartered state dental association, their rank to be determined by lot at each succeeding meeting of this body after this meeting, when the lot shall determine between those present. Each state to pay $10 per annum and receive equal share of literature, which literature shall be the aggregation of state proceedings or foreign nations which have been approved or at least not condemned by the critics. The recording secretary shall receive $300 for each meeting, this amount to include a stenographer; corresponding secretary, $25 for each meeting; president, for each meeting $30. Biennial meetings to be held at Washington City."

That is in the rough, to be worked out when the president has been elected.

On motion the above communication was referred to a committee of three with instructions to report at the next meeting of this association. The Chair appointed as such committee Drs. Wright, Green and Hatfield.

Dr. McCurdy: I am somewhat nonplussed about this paper; I cannot understand the gentleman and should like to ask him a question, but if I do I don't want the gentleman to be offended.

Dr. Wright: I will not be offended; I am used to it.

Dr. McCurdy: I would like to ask the gentleman if he means this as a burlesque, or does he mean to get up another organization?

Dr. Wright: Thank you, sir; I appreciate it from more positions than one. I was perhaps too unguarded to defend that point and I thank the gentleman for approaching where the hornet sat down. It is not a burlesque; it is a thought thrown out for consideration. If you think of it, what is it? You stimulate state dental associations to better actions and more careful work. Their literature is poured into this body to be revised and edited—not only states but the world. That is one object. But it is too crude; it came to me in a moment; thinks I "It is good, I will give it to them." And as to burlesqueing, I do not presume to burlesque anything except perhaps myself. But the idea to me is a serious one. "Active and ex-members of state dental examining boards"—how many? Think! "Active and ex-members of state dental faculties"—how many? Think! "Active and ex-presidents of chartered dental associations"—how many? Think! And of all of the earth besides. Would you burlesque it? Not I. I am afraid of them. I am a little bit cowardly anyhow and I like the idea of being afraid if I can put that fear in the right place, for then it makes me toe the mark. It is brand new to you gentlemen and it is almost brand new to me and I just ask that you think of it. Some one suggested that this be referred to a committee of three. I ask for a committee of the whole, to report next year. You will have time to think of it; it will perhaps take larger proportions in your mind and be worked out in better shape than with me. The thought came to me; I think it belongs to you. I give it to you!

Dr. McCurdy: I am very much obliged to the gentleman for his explanation. When he said that while he did not expect the members to agree with him, still it might amuse them, I could not just understand his meaning.

Dr. Barrett: While we are waiting for the report of the committee on conference I should like to say that I would like to see the association of examiners wake up and do something to raise the standard of dentistry, and pass at least one resolution to that effect so that I can go home to my native board and report it. I have not been able to recognize a single thing which we have done since the beginning of this meeting that has had a tendency to even hold the standard of dentistry where it is. Not only that, but everything has been done with a tendency to lower the standard; it has been a pulling down ever since I have been here. I came here with the idea that this organization was formed for the purpose of building dentistry up, not pulling it down. If I can take one report of an uplifting back to my state association I shall be very glad indeed.

Dr. Moore: I am very glad indeed to see a gentleman who is here, I think, for the first time take that view of the case There are some of us who have been attending this national association for years and who have been working just on that line. But it seems to have been the policy here this year to pull down and break down, despite the protest of those who have had experience, everything that has been done and to put us back where we were some seven or eight years ago. What we have done has been accomplished year after year—a little at a time, for it had to be done a little at a time; and perhaps what was done last year was a little too drastic, and because there were criticisms upon it and because some of the faculties stirred up trouble about it, it seems that those who came here this year were utterly demoralized and felt that we must take a back track and give away everything, and I am very glad that one of the gentlemen who is here for the first time wants something to be done in the opposite direction. But what can we do now in the face of what we have done?

Dr. Meeker: Article II of our constitution says, "The objects of this association shall be to secure, through the operation of the various state examining boards, a high and uniform standard qualification for dental practitioners and, as far as practicable, uniformity of methods in the working of those boards and of legislation in creating them." It seemed singular to me as I sat here this afternoon, after being here so many years, to see the association retrograding. What were we formed for? A series of examining boards throughout this country to raise the standard of the dental practitioner, the standard of examining boards and the standard of qualifications. I do not want to say a word against any of these gentlemen who are working hard on this conference committee—they are my friends; but it seems to me we are retrograding. We are the ones to do the upholding; we have nothing particular to do with the college faculties. We make our standard of qualifications and each board here, in the exercise of the police powers bestowed upon its board by the laws of the state, recognize certain colleges which come up to a certain standard. In that we have nothing whatever to do with the faculties' board that I can see. It makes no difference to New Jersey, because we have our standard by law; no man can be examined unless he is a graduate of a reputable dental college that is recognized on the list of this board. We have this national association as a standard, and if this association says in its printed list that such and such a college has a high standard of preliminary examination we accept that college diploma and examine the applicant. If there is to be a lowering of the standard and the preliminary examination is lowered I tell you plainly, and I think my state will back me up, New Jersey will not recognize the college that lowers its standard, even if it is on the list of this association; although we are with the association, our effort is to have it higher. The very article that I read, by Dr. Ottolingui, seems to me to contain this matter in a nutshell. Through sympathy with colleges which are struggling to secure a financial position in the world we lower the bars somewhat to enable them to get along. I do not think that is right; by so doing a lot of incompetent men come in and graduate. They are lowering the standard of ourselves, of our state and of our association.

Dr. Johnson: It seems to me that everything we have done since we have come here has been to retract. This conference committee may have done what they deemed best—they may have acted, as they thought, advisedly; but, sir, I cannot but differ with them. The dignity of this association ought to be upheld. If we are just going to pass a resolution and send it over to the Association of Faculties and say, "Will you comply with this?" and get a negative answer, and then say, "Well, if you won't comply with it we will qualify it until you will," where are we? I tell you, sir, I do not believe that is the way to raise the dignity of dentistry or the dignity of this association. Just a little independence goes a long way at times, and I know the colleges throughout the country do value the recognition of this association very highly. I know from experience how hard some of these colleges have fought to gain this recognition; they do value it very highly, and when it comes down to the point they are going to comply with your regulations before they will be stricken off the list. I tell you it means students to them; it is an advertisement for them; it raises them, as well as it does ourselves, to maintain the standard. I am not satisfied to go back to Georgia and report to my board that we have come here and taken down the bars, and now every student who can write his name, or that can't write his name even, can matriculate and enter the profession. It is my experience, sir, that when a student enters a college and gets a diploma, it matters not whether he gets recognition from the state board he is going to practice somewhere and somehow. The remedy is to raise the standard of the preliminary examination. That is the only way on earth by which the profession of dentistry can be raised. Dr. Brown offered a good resolution this morning and I hope that before this association adjourns that resolution at least will be passed.

Dr. Faught: I dislike exceedingly to speak on this subject, but I do want to make matters very clear and plain so far as my information goes and I do desire that this association shall act intelligently. Your committee on colleges has very carefully canvassed this matter with the colleges now on the recognized list. We have drawn our information from men who stand high in connection with the Faculties' Association and we learn that any attempt to fix a standard here will probably be met by seventeen colleges that will not uphold anything above the standard of 1884. There are about thirty-five colleges on our recognized list at the present time; take away seventeen from that and it gives us eighteen. If this standard which was read this morning and asked to be made your standard shall be adopted we could admit more colleges from that list; they stand ready to agree to it; then we would have at least twenty-five colleges who would undoubtedly agree to that in spite of anything the Faculties' Association might do. They would agree to it personally for the sake of appearing upon the list, and we would have a list then that would represent a majority of the colleges of this country, and if we do not do that we simply do what the Faculties' Association—or I should say the few, and the very few men who have raised this turmoil—would have us do, and that is for this association to give up their work and take simply the laws of the Faculties' Association and wreck our organization entirely. [Applause.]

(To be continued.)

News Summary.

To Sharpen Hypodermic Points.—First pass the cleaning wire through so that it protrudes at both ends of the needle. Take a corundum wheel, and with the engine grind off the point of needle with the wire at same time. The wire can then be pushed through from the other extremity, carrying all the debris with it. Thus the needle will be perfectly clear.—*Dr. F. B. Spooner.*

Sanitary Methods for Barbers.—The police of Paris now compel barbers and hairdressers to take sanitary measures in carrying on their business. All metallic instruments, razors, combs, shears, cutting-machines, etc., must be kept in a solution of soap and boiling water for ten minutes before being used. Only nickel-plated combs are allowed. Pulverizers must be substituted for powder puffs. Cut hair must be covered with sawdust and emoved at once. The hands must be washed before waiting on a customer.

Illegal Practice of Dentistry.—A man who was recently convicted of practicing dentistry without previous registration, as required by the law of this state, was fined $150 in special sessions. The three justices agreed in regarding the accused's action as a clear violation of the law, and said that they believed the dental law to be for the general good of the public, and expressed their pleasure in the opportunity afforded them of upholding the law. The man's employer was sharply rebuked for consenting to his violation of the dental act, and, perhaps as a mark of contrition or in reparation of his wrong, he paid the prisoner's fine.—*New York Medical Record, Oct. 23.*

Tears Are Good for Woman, says Dr. Campbell, in *The Hospital.* The beneficial effect of a good cry to a woman, he asserts, is partly due to the increased depth of respiration and the improvement in the often languid circulation thereby induced, but to a large extent it is the result of the muscu-

lar exercise involved, by which the general vascular tension, and especially the blood pressure in the brain, is much reduced. The profuse flow of tears no doubt also acts strongly on the cerebral circulation in still further reducing tension. The sobbing movements, again, have a good influence upon the venous circulation in the abdominal and pelvic viscera, while the exhaustion produced tends to cause sleep and thus to give the nervous system its best chance of recuperation.

ADVANCE OF DENTISTRY.—One whose knowledge of dentistry was obtained only a few years ago, but who has not kept thoroughly in touch with the rapid advances in this branch of medical science, would be astonished on opening this work to see what has been accomplished in the past decade; almost a new science has been created. Dentistry is sometimes regarded as a special branch of surgery, but in reality it is a profession in itself, divided into almost as many specialties as is the profession of medicine.—*Book Review in Medical Record.*

NASAL MICROORGANISMS.—(1) In all bacterioscopic investigations of the nasal fossæ, in all researches as to the action of nasal mucus, etc., a clear distinction must be made between the vestibule of the nose and the proper mucous cavity. The former is lined with skin, and is not part of the nose cavity proper, but only leads to it. (2) Contamination with the lining of the vestibule is difficult to avoid, even when this source of error has been realized. (3) In the dusts and crusts of mucus and debris deposited among the vibrissæ of healthy subjects microorganisms are never absent, and are usually abundant. (4) On the Schneiderian membrane the reverse is the case. Under normal conditions microorganisms are never plentiful here, are rarely even numerous, and in more than eighty per cent of cases no organisms whatever are found and the mucus is completely sterile. (5) The occurrence of pathogenic organisms must be so infrequent that their presence on the Schneiderian membrane can be regarded only as quite exceptional.—*Thompson and Hewlett, Arch. of Otol., xxiv., 3 and 4.*

GLOWWORM'S LIGHT.—The glowworm's light is said to have been shown to be due to the emission of rays similar to the Roentgen rays. Three hundred glowworms were caught near Kioto and placed before photographic plates screened from the light by several thicknesses of black paper, together with plates of brass, copper and aluminum. A piece of cardboard with a hole in it was placed between the metal and the photographic plate, and for two days the arrangement was kept in a dark chamber sheltered from all foreign lights. On developing the plate, however, it was found to be blackened, except the part opposite the hole in the cardboard. The rays of the glowworm would therefore appear to penetrate metal and excite luminosity in cardboard. When there is nothing between the sensitive plate and the glowworm the rays are said to behave like ordinary light, but in traversing some metals and cardboard they seem to acquire properties like those of the X-rays, or it may be that the glowworm emits X as well as ordinary rays. This account savors somewhat of the improbable, and in regard to the latter part of it, there may be a third explanation.—*Pharmaceutical Journal.*

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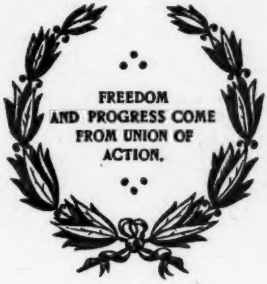

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NOTE—To open tubes of Pyrozone 25 per cent Solution, wrap the tube in a cloth and nip off the top with a pair of forceps having concave beaks. Do not hold the tube in the open hand, as the warmth of the latter is sufficient to boil the ether and so cause pressure to develop.

Pyrozone Solutions are free from Borium Salts, Excess of Acid, Glycerin, Salicytic Acid or other injurious preservative.

Illustrated Pamphlet sent Free on application.

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There are so many important things about the

A=Os,

that are impossible to explain in this limited space, that upon the receipt of a letter or postal card from any dentist, some very valuable information will be sent to him by return of mail. Try it!

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MUNSON'S "Plastic Aluminum" TRADE-MARK

PLASTIC ALUMINUM

FOR FILLING TEETH

EASILY INSERTED AS CEMENT. NO MERCURY USED

MAKES A CLEAN, BRIGHT, DURABLE FILLING

SATISFACTION GUARANTEED. TRY IT

PACKAGE 3 BOTTLES—MAKES 25 OR 30 FILLINGS. PRICE, $1.25.
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THIRD REVISED EDITION

R. L. POLK & CO.'S

DENTAL REGISTER

OF THE UNITED STATES.

The Third Revised Edition will be issued in the Spring of 1898 and contain the names and addresses of over **20,000 dentists** with **graduation particulars** alphabetically arranged by towns and states, a list of all **Dental Colleges** in the United States and Canada, and synopsis of the **State Laws** regulating the practice of dentistry. It will also contain a large amount of other information calculated to insure for it a large circulation throughout the country.

It is the **only National publication** of the kind and is conceded to be the standard and recognized Dental Directory and list of Dentists, Dental Institutions and Societies.

If you have anything to say to the **20,000** Dentists in the United States there is no better or more economical way of saying it to them than by an advertisement in the Register, or if you wish to send them your circulars, the Register contains the list in convenient form for addressing.

Dentists are requested to send to the publishers all changes of address and particulars in regard to their alumni or registration.

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Special Notice!

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PLAIN AND GUM TEETH, and BLOCKS

for rubber and metal bases.

Orders for Teeth, as well as for the great variety of articles needed by the Dentist, will receive prompt attention at our

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This set of Meister's Matrices realizes the highest conception in practice, and fills the wants of a large class of careful operators. Any band can be adjusted to appliance by means of slots shown on enlarged illustration.

Price, 1 Appliance and 7 Bands, $1.50

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IMPROVE YOUR BRIDGE-WORK

Electro Plating will make your bridge-work far superior to others. Solder will change color in the mouth. By plating with pure gold the bridge will always remain one bright, rich color.

With our **New Electro-Deposit Outfit** you can use any karat solder, then plate with pure gold. Should platinum show, it plates so that it can never be noticed. Gold plate your brass samples of work. The plate will last for years.

NICKEL PLATE YOUR OWN INSTRUMENTS

We send everything complete for $5.00, which includes one quart of gold solution, one-half gallon of nickel solution, and battery complete. You are ready for work in five minutes after receiving outfit. Full instructions for plating with each outfit. Cash must accompany order, or sent C. O. D.

THE GOLD PLATING IS UNEXCELLED

THE ELECTRO MFG. CO., 109½ N. High St., Columbus, O.

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H. B. WILLSON & CO.

PATENT LAWYERS,

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Wanted—Competent salesman acquainted with the trade to handle our new "Dental and Surgical Lamps," either as a side or direct line. An entirely new thing just being introduced. For further particulars address,

PACIFIC ELECTRIC CO., 120 Main St., La Crosse, Wis.

Patients Pleased at Painless Results

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ROBERT D. MCBRIDE, D. D. S.

The anesthetic will permit of the extraction of several teeth without inflicting the many discomforts, and healing is very rapid—no sloughing.

No. 1. Tonic for depressed patients which removes all fear of an operation.
No. 2. Anesthetic which gives painless results.
No. 3. Pyorrhea and Abcess cure. Each 50c, or the three $1.00.

Many dentists prefer to make their own anesthetics, rather than to buy nostrums whose contents are unknown. All the above formulæ have proved their worth, and the suggestions furnished with each printed copy are invaluable as touching different operations. Send stamps or P. O. order together with stamped addressed envelope to

Dr. J. AUSTIN BUCKNALL, 28 Fort St., West, Detroit, Mich.

Gold Colored Amalgam will not shrink or tarnish; holds its gold color perfectly; good Edge Strength.
Price, per 1-8 ounce, $2.00.

Electro Deposit Crowns, Bridges, Plates and Regulating Appliances. Crowns, seamless and perfect, $2.00 each. (Send Plaster Model.) Order our Gold-Plating Outfit and make your own Crowns. **Price, $10.00.**

CROWN & BRIDGE CO., 41 N. Centre St., Cumberland, Md., U. S. A.

Chase Combination Dental Plate Company

PAXTON BLOCK, OMAHA, NEB.

Keep in stock the goods manufactured by the

Dental Protective Supply Co.

"Fellowship" Alloy
"Fellowship" Broaches
"No. 1" Handpiece — "Dual Blade" Burs
"No. 1" Engine — "Lithos" Cement
Cataphoric Outfits
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Good Resolution.

Resolve to Have Your Instruments Sharp . . .

Send them to us and we will help you begin the new year right.

As you will probably read this ad on New Year's Day, when you have a little leisure, make up a package for us before the matter has escaped your memory.

Cash Prices

	Per Dozen
Cavity Burs, recut and stoned, .	$0.60
In six dozen lots, ...	.50
Finishing Burs, recut and stoned,	1.20
Excavators Repointed, .	75c to 1.00
Pluggers Reserrated, ...	1.50
Nickel Plating Forceps, . . .	50c each

We make a specialty of Handpiece Repairing. Estimates given of cost of all Repair Work.

The Dental Protective Supply Co.

1101-3 Champlain Building

CHICAGO.

Don't Be Impatient

IF YOUR ORDER FOR BROACHES IS DELAYED A LITTLE. WE ARE MAKING THEM JUST AS FAST AS WE CAN, BUT ARE SWAMPED WITH ORDERS. . . . . THE DENTISTS LIKE

... The ...

"Fellowship" Broach

BECAUSE IT IS THE **BEST MADE**, AND BECAUSE IT IS . . . . .

$1.00 Per Dozen Cheaper.

This broach is superior to the "Donaldson," for the reason that the blades on the latter are arranged spirally, thereby necessarily producing a corkscrew or gimlet movement in their withdrawal from the canal, and thus lessening their entangling power. Furthermore, the blades are so close together, being on four sides, that they cut the pulp to pieces in extracting it.

Our broach is barbed equally on three sides only, and the blades are cut at right angles to the broach, so that they remove the entire pulp easily and perfectly. This arrangement of the blades is not only the best for removing debris from, but also for scraping and enlarging the sides of, the pulp-canal.

Made of tough steel piano-wire, spring tempered. Put up in four styles: Fine, Medium, Coarse, and Assorted.

Send $1.50 for a Sample Dozen.

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"DUAL BLADE" BURS

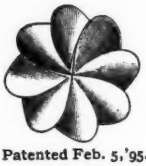
Examine the Blades

(SELF-CLEANSING)

Patented Feb. 5,'95.

The twin blades traverse the entire cutting surface of the bur.

These burs clear themselves when in use, enabling the operator to work rapidly, and they shave, not grind, the dentin.



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WHEN ORDERING PLEASE STATE THE STYLE REQUIRED.

For Universal Handpieces.

For No. 2 Right Angle Attachment.

For Nos. 1 and 3 Right Angle Attachments.

For Davis Angular Handpiece.

KEPT IN STOCK IN THE FOLLOWING SHAPES AND SIZES:

Round. Wheel. Cone. Inverted Cone. Pear. Bud. Pointed Fissure. Square Fissure. Oval.

Painless Dentistry is possible with "Dual Blade" Burs.

PRICE

Per Dozen, $1.50
Per ½ Gross, 7.50

Dental Protective Supply Co.

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"NO. 1" HANDPIECE

Patented Feb. 5, '95.

Designed and Manufactured by

The Dental Protective Supply Co.

A glance at the accompanying cuts illustrating this Hand piece will demonstrate the simplicity of its mechanism.

We have endeavored to design and place before the profession the most simple and durable Handpiece made.

The special features of the Handpiece are the double end chuck, the improved locking device, and long and efficient bearings.

Ample provision has been made for taking up all wear, and we guarantee that if the bearing surfaces are kept clean and well oiled, that this Handpiece will last for years, and prove the best that has ever been placed upon the market.

It is adapted to hold different forms of bit shanks (except cone journal) which can be inserted or taken out from the Handpiece while the engine is in motion; it is also designed so that it can be attached to any Dental Engine, and will fit all ordinary right angle attachments.

Owing to the entire absence of screws the Handpiece can be taken apart without the use of wrench or screw-driver, and is so constructed that escape of oil upon the hand of the operator,—an objectionable feature in some handpieces—is entirely avoided.

In ordering our No. 1 Handpiece, it is essential that you give all necessary particulars as to the style of your engine and attachments

PRICE - - - - $10.00.

—ORDER DIRECT FROM—

THE DENTAL PROTECTIVE SUPPLY CO.

CHICAGO, ILL.

Rubber Dam, medium or thin, per roll - - $1.00
Rubber Dam, heavy, smooth, 5 in. wide, per roll **1.25**
Rubber Dam, heavy, corrugated, in rolls 15 ft. long by 6½ in., per roll - - - - - **1.25**

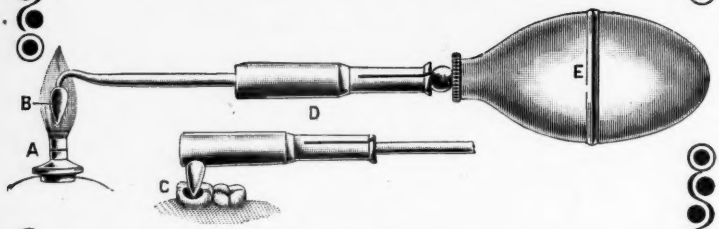
ALSO A LIGHT-COLORED RUBBER DAM, TOUGH AND ODORLESS,
Manufactured by the I. B. Kleinert Rubber Co.

Twenty-five sheets, size 6x9 in., medium corrugated, and thin or medium smooth, per box, - - **$1.50**
The same Dam in rolls, 5 in. wide, - - - **1.50**

The Dental Protective Supply Co.

1101-3 Champlain Bldg., Chicago, Ill.

Philadelphia Hot-Air Syringe



This Syringe Fills a Long-Felt Want

The point (B) is solid, except for a hole through the center, and retains the heat. The wooden shield (D) keeps the hot point from burning the lip or gum, as shown in cut (C). **Price, $1.50 each.**

Chip-Blower and Hot-Air Syringe combined, same principle as above, without wooden shield. **Price, 75c each**

A full line of Chip-Blowers, Air and Water Syringes always on hand.

Dental Protective Supply Co.

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CASH MUST ACCOMPANY ALL ORDERS

Plain.....—Nos.	8	7	6	5	4	3	2	1	0
Corrugated—Nos.	½	¾	1	2	3	4	5		

NOTE—We keep Nos. 7 and 8 Plain Cylinders in HALF INCH LENGTHS—both soft and cohesive.

We also keep in stock ASSORTED CYLINDERS in one-eighth ounce boxes—both soft and cohesive.

PLAIN AND CORRUGATED CYLINDERS

SOFT, AND COHESIVE

Per ⅛ ounce.....	**$4.00**
Per ¼ ounce.....	**15.00**
Per ounce.....	**29.00**
Two ounces at one time; per oz.	**28.00**

Each box of Plain Cylinders is labeled showing the proportion of a sheet of Foil contained in each Cylinder.

THE DENTAL PROTECTIVE SUPPLY CO.

1101-3 CHAMPLAIN BUILDING, CHICAGO.

CASH MUST ACCOMPANY ALL ORDERS

FELLOWSHIP GOLD FOIL

Soft, Semi-Cohesive, and Extra Cohesive Foil,
Nos. 3, 4, 5, 6, 10, 20, 30, 40, 60.
Corrugated Foil, Soft, and Semi-Cohesive,
IN ABOVE NUMBERS.
Rolled Gold Foil, Extra Cohesive,
FROM NO. 20 UPWARD.

Price, per ⅛ oz. **$4.00** per ½ oz. **$15.00** per oz. **$29.00**

"Fellowship" Gold Foil, untrimmed, per ⅛-oz., $3.50.

The Dental Protective Supply Co.
CHICAGO, ILLINOIS.

Go to FRANK E. RUGG

...FOR...

171-3 S. Canal St.
Chicago, near Union Depot.

RELIABLE
REASONABLE

Gold, Silver and Nickel...
Plating

NOTE—City patrons will please drop postal card, and messenger will call for work next morning and promptly return same.

PLATINOID

Have You Tried It ?

A New Metal, Prepared Expressly for the Dental Trade. Is Non-Corrodible and Fuses at 2,600 Degrees Fahrenheit.

Supplied in the following forms:

Platinoid Plate for Crown and Bridge Work, three pieces, each three inches square, assorted gauges	$1.00
Platinoid Bars for strengthening Rubber Plates, per doz	.50
" Nerve Canal Explorers, each	.20
" Screw Posts, per doz	.75
" Wire; round, square or triangular; 12 lengths, each four inches long, and of assorted gauges	1.00
" Cement Spatulas	.50
" Nerve Broaches, per doz	1.00

MANHATTAN DENTAL CO.

745 Sixth Ave., New York City.

We keep a full line of the above goods at our depot...

The Dental Protective Supply Co.

1101-3 Champlain Bldg., Chicago, Ill.

This is a faithful representation of this beautiful preparation of gold, as seen under the microscope. It represents a single layer of the gold as deposited by electricity. It is a picture of the active surface of the growing-up mass of crystals, of which Crystal Gold is entirely composed.

Why is it ?

One of the unexplainable things in life is that people should ignore the best things. Nobody can tell why this should ever be the case, but it is so in every business in the world.

There are dentists who do not use

Watts' Crystal Gold.

There are dentists who stick to Gold Foil, when day after day, for the last forty years, many of the most distinguished and successful dentists in the world have been lavish in their praise of Crystal Gold.

There is no question about the purity of my Crystal Gold. It *must* be 1,000 fine or it cannot be manufactured in the shape it is sold.

Forty years ago I discovered the process of making Crystal Gold. Since that time the secret has never been revealed. Nobody else in the world can make it.

My advertisements must necessarily be addressed to those dentists who do not use Crystal Gold. Those who do use it need no urging to buy it.

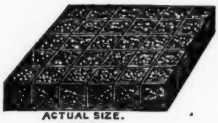
Crystal Gold is soft and spongy. It penetrates every nook, corner and crevice with little force. It is easier to use and more certain as to results than foil. It never balls or crumbles. It excels in contour work. It saves time. "Time is money." A dentist can do more work with it and better work. It is always ready to use. When you want it, there is no rolling, folding or clipping.

All that is asked is a trial order. If it is good, buy more. If it isn't, don't buy more.

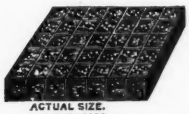
STRIP GOLD.

ACTUAL SIZE.

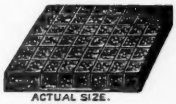
GOLD CUBES.



ACTUAL SIZE.
LARGE.

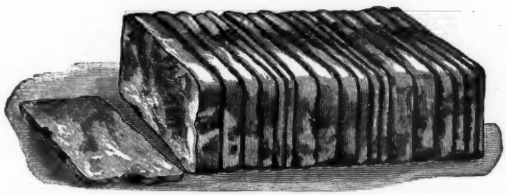


ACTUAL SIZE.
MEDIUM.



ACTUAL SIZE.
SMALL.

SLICED GOLD



New Forms of Crystal Gold.

Most dentists are familiar with the old form in which Crystal Gold was sold. Within recent times I have introduced new and more convenient shapes. The above illustrations show these shapes. They represent the actual sizes. Some dentists prefer the Strip Gold, shown in the first illustration. Perhaps the Gold Cubes are the most used. Each Cube is barely joined to the rest. A mere touch will sever it. The operator can scarcely realize how convenient the Crystal Gold is in this shape until he tries it. The Cubes come in three sizes, and exactly what the dentist requires is what he can have. Those who prefer the Sliced Gold can also be supplied.

The above cuts showing the plume-like, feathery form of the Crystals forming the gold represent the new labels used on boxes containing Crystal Gold.

Crystal Gold is not the lowest priced gold for dentists as far as first cost is concerned, but is far and away cheapest when results are considered. Sold by all good dental depots, or it will be sent direct by me on receipt of price.

	⅛ oz.	¼ oz.	1 oz.	2 oz.
"Crystal Gold,"	$4.00	$15.00	$29.00	$56.00
"Crystal Gold Cubes,"	4.00	15.00	30.00	
"Crystal Gold Strips,"	4.00	15.00	30.00	
"Sliced Crystal Gold,"	4.00	15.00	30.00	

A. J. WATTS,
P. O. Box 1296, New York.

Eucain Hydrochlorate

A NEW LOCAL ANESTHETIC

far less toxic than cocain, while fully equal to it in anesthetic effect, and permanent in solution. Eucain Hydrochlorate has been used with excellent results by Geheimer Medicinalrath Prof. Dr. O. Liebreich, Dr. C. L. Schleich, Sanitätsrath Dr. Reichert, Prof. Dr. Warnekros and Dentist Kiesel, all of Berlin, Dr. Emile Berger, of Paris, Dr. R. Brudenell Carter, of London, A. Swanton Burke, D.D.S., Theod. F. Chupein, D.D S., E. C. Baughan, D.D.S., all of Philadelphia, S. C. G. Watkins, D.D.S., Montclair, N. J., A. A. Shaw, D.D.S., Cambridgeport, Mass., and others.

Directions for the Preparation of a Sterile 5 per cent solution of Eucain, as generally employed in dentistry and surgery.

To 1 part of Eucain Hydrochlorate add 19 parts **distilled** water (for example, 15 grains of the drug to 5 fluid drams of the menstruum) and heat the mixture in a test tube or other small vessel under constant shaking, until solution is effected. If it is not quite clear, the solution must be filtered. It is then heated to boiling in the test tube, the mouth of which must be plugged with cotton.

Cooling can be hastened by holding the tube in cold water, and the solution is then ready for use.

As Eucain solutions can be rendered absolutely sterile by boiling immediately before use, no admixture of antiseptics is required. In this respect it differs from cocain, which is decomposed by boiling. **Distilled water** only should be used for the Eucain solutions.

Formalin, Trikresol. CREDÉ'S Citrate and Lactate of Silver.

Literature Upon Application.

Schering & Glatz, 55 Maiden Lane,
NEW YORK...Sole Agents for U. S. and Canada

A Request

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The management of the DENTAL DIGEST therefore assume that our readers are ready to assist in the good work. As everyone knows, the subscription price of a journal barely covers the mechanical cost of publication. The main source of revenue must therefore be from advertising. We do not ask our readers to advertise, but we do ask them to

Kindly mention the Dental Digest when writing advertisers.

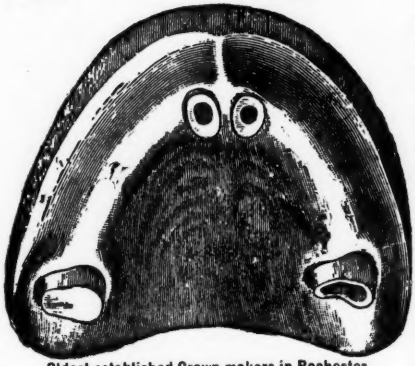
GOLD SEAMLESS CONTOUR CROWNS.

With Solid Cusps.

NO MORE WEARING THROUGH. NO MORE SOLDERING.

A CROWN COMPLETE AND READY TO SET.

Send for post-graduate circular.



Oldest established Crown makers in Rochester. We lead, others follow.

We have been manufacturing Crowns and Bridge Work for several years, and have been making progress in the work slowly indeed at first, but now our patrons are to be found in every state and territory in the Union.

Crown Work.—Our Centrals, Laterals and Cuspids are patterned closely after nature and are easy to adjust, thereby making them the most perfect of front tooth crowns. They have also a solid cutting edge, and contain more gold than any crown in the market for the price. In ordering Crowns, send well-defined plaster model with tooth to be crowned marked, and be sure and **measure tooth with wire,** and we will make a perfect fitting crown.

Bridge Work.—We call particular attention to our Bridge Work, which is made in the most perfect and artistic manner.

The Cusps on our Bridge Work are not made of a thin piece of gold, but are heavy and solid.

PRICE LIST.

Molars, Centrals, Laterals and Cuspids, former price, $3.00; now	$2.25	Open-faced Crown	$3.50
Bicuspids, former price, $2.50; now	2.00	Richmond Crown, Gold Tip	4.00
Regular Bridge Work, with Gold Cusp, per tooth	3.00	Richmond Crown, without Tip	3.50
Regular Bridge Work, without Gold Cusp, per tooth	2.00	Excelsior Crown Cement, per package	1.00
		Excelsior Anesthetic, per oz., $1; 10 ozs.	6.00
		Excelsior Porcelain-faced Gold Crowns	5 00
		Swedging Gold and Aluminum Plates	3.50

For extra long tooth an additional proportionate price is charged.

When the Money does not accompany Order, Goods will be sent C. O. D. Write for large Circular with Instructions. *Send* all Orders to

J. L. WELLER, 41-45 Elwood Building, Rochester, N. Y.

PRACTICAL SCIENTIFIC **WELD'S** DELICATE PERFECT

"Chemico-Metallic Method"

FOR FILLING THE

Difficult Root-Canals

Of Semi-Devitalized Teeth.

Anterior view of anterior root of lower molar with two nerve canals disinfected and filled by the **Chemico-Metallic Method**; root filed away, showing metal, oxid, albuminate, etc. Time of operation, three minutes; putrescent pulp in canals not extracted.
Photographed from the original tooth. Harjes & Wright, New York.

View of superior molar disinfected and filled by the **Chemico-Metallic Method**. Roots filed away, showing metal, oxid, albuminate, etc. Time of operation, eleven minutes; putrescent pulp in the buccal root-canals not extracted.
Photographed from the original tooth, Falk, Madison Square, New York.

Superior bicuspid, two canals and two foramens. Disinfected and filled in four minutes. Photo. from the original tooth. Harjes & Wright, New York.

Superior bicuspid, one canal, bayonet-shaped root, showing adaptation of metallic bristle. Disinfected and filled in two minutes. Photo. from the original tooth, Harjes & Wright, New York.

Superior bicuspid; one foramen, with two canals converging. Disinfected and filled in three minutes. Photo. from the original tooth, Harjes & Wright New York.

THE Method presupposes, as a rule, no loss of tooth substance; that wherever one of the finest Donaldson Steel Broaches can be introduced into a root-canal, whatever its length, whether straight or tortuous, whether filled with semi-devitalized matter or putrescent pulp and fetid gases, that canal can be disinfected and filled within a period of five minutes; that the chlorine gas employed tends to disinfect the dentinal fibers in the roots, assuring permanency of asepsis. Full information and instruction, together with package containing acid and points sufficient in quantity and number to fill thirty root-canals, will be sent, post-paid, on receipt of

Price, $3.00

To any dentist giving the method a conscientious trial the money paid will be refunded if the results prove unsatisfactory.

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Broadway and Twenty-Sixth St., NEW YORK.

THE RUSSELL

Electro-Magnetic Dental Mallet.

Patent Allowed

The illustration shows the mallet and battery complete.

One of the many advantages our mallet possesses over others is the ease and freedom with which it is held in the hand. It is light in weight, and what weight there is is within the hand, so that it balances and there is no dragging back as with others.

No other mallet approaches ours in ease of management, in the range and perfection of its adjustments and the facility with which these adjustments are made. It will strike single blows like the "automatic," or it will strike at any desired speed up to 2,000 or more per minute. It will strike as lightly or as heavily as you wish at whatever speed it is running or when striking single blows. In short, the operator can always get any kind of blows he wishes, or at any time use the mallet as a simple hand-pressure instrument. And further, the weight of the hammer is readily changed to suit each operator's peculiar ideas. In whatever manner it may be working the blows are always positive; made so by a simple construction which is found in no other mallet. It will work perfectly any variety of gold, and in any position that can be reached by the "automatic." And any point that fits the "automatic" also fits the "RUSSELL."

The battery we furnish is of the well-known Mesco Dry Cell variety. The operator need never give it any attention, and he is always sure to find it ready and waiting no matter how long it may have been kept waiting. There is no dirt or slop, for the reason that the chemicals are sealed up and are never opened. When the cells are exhausted they are discarded and new ones substituted at very slight expense, so that the cost of operating the mallet is low.

Send for Testimonials and Circular A, which gives a full description of the complete apparatus.

Price: Mallet, footswitch, battery, and cords complete, ready for operating **$35.00**

Without battery, ready to attach to any suitable battery . . **$27.00**

Fully Guaranteed. If not Satisfactory Money Refunded.

FOR SALE BY

THE DENTAL PROTECTIVE SUPPLY CO.

1101-3 CHAMPLAIN BUILDING, CHICAGO.

Or sent prepaid, C. O. D. or upon receipt of price, by the Manufacturers.

The RUSSELL ELECTRIC MALLET CO.

MONROVIA, MARYLAND.

...THE...

Safety Angle Attachment.

Fig. 1.

Fig. 2.

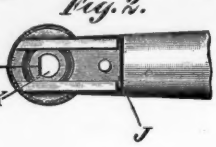

Fig. 3.

Section showing details of construction.

Fig. 4.

Slide or Thrust-Plate open, ready to receive the Bur.

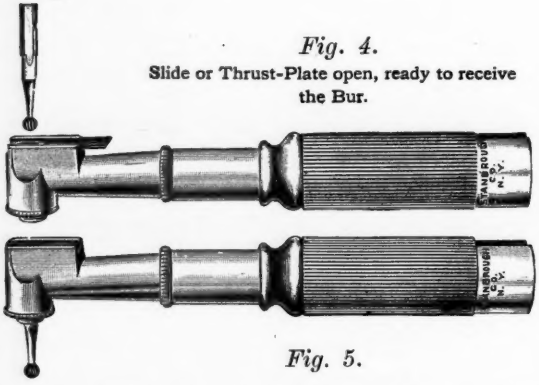

Fig. 5.

The Bur in place, Side-Plate closed. Instrument ready for use. Made to fit any Hand-Piece.

PRICE $6.00

Send for Descriptive Booklet. Manufactured by

RUFUS G. STANBROUGH CO., 203 W. 52D ST., NEW YORK.

GOULD DENTAL CHAIR.

Fig. IV Normal.

We would merely call your attention to a few of its Advantages over all other Dental Chairs:—

1st. The Gould is the only first class low priced chair.
2nd. The Gould is the only low priced pedal lever chair.
3rd. The Gould has more and better movements than any high priced chair made.
4th. The Gould is the only chair that has the Horizontal Anæsthetic Position.
5th. The Gould is the only chair that has the Chloroform Narcosis Position.
6th. The Gould is the only complete chair, requiring "no extras."
7th. The Gould obtains all the positions secured by other chairs and more.
8th. The Gould chair has the most satisfactory head rest made.
9th. The Gould is the only chair made that gives you the side tilt without "extra cost."
10th. The Gould is the simplest and therefore the easiest to keep in order.
11th. The Gould is the only chair with which an Elegant Nickel Spittoon is furnished Free.
12th. The Gould is the only chair that can be tilted forward for taking impressions.
13th. The Gould is more convenient to the operator than any other.
14th. The Gould gives satisfaction when others fail.
15th. The Gould is the *best* and *cheapest* chair in the world.
16th. The Gould is sold on its merits and is warranted to be as represented.

Fig. XVIII Chloroform Narcosis.

CANTON SURGICAL AND DENTAL CHAIR CO.,

38 to 54 E. Eighth and 50 to 54 S. Walnut Sts., CANTON, OHIO.

Sole Manufacturers Gould Dental, Gould Motor Dental and "Yale" Surgical Chairs, Electric Dental Engines and Brackets, Fletcher Fountain Spittoons, Foot Power and Electric Cord and Cable Dental Engines, etc., etc.

I TELL THE TRUTH

when I say **Dentists' Friend** has no equal for polishing gold crowns, plates, bridges and rubber work—it removes file marks, all traces of seams in the crowns like magic—it is ready prepared in cake form. Full directions with each cake. Price 25c. postpaid.

Mention Dental Digest.

A. W. THOMA, Mineral Point, Wis.

Call or write and you will receive prompt attention.

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DENTAL DEPOT,

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Has constantly on hand a stock of

THE DENTAL PROTECTIVE SUPPLY CO.'S

"Dual Blade" Burs.
"Fellowship" Alloy.
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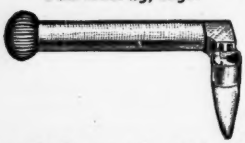
"Lithos"—a zinc phosphate cement.
"No. 1" Handpiece.
"No. 1" Engine.
"English Teeth.
Cataphoric Outfits.

Pat. Dec. 29, 1896.



The Universal Matrix Carrier

Is the only retainer and carrier combined. You will see by the cut that it is so constructed that it can be attached to any size tooth without change of matrix. It is made to carry the thin steel ribbon band matrix. By turning cap at end of barrel, you cause matrix to close around and hug, until it conforms to shape of tooth. You do not need to have a different matrix for different teeth; one does for all. Sent to any part of the United States on receipt of Post Office Order for $3.50. Address

Dr. J. M. STROUT, Dentist, 457½ Congress St., Portland, Me.

The accompanying cuts represent

A NEW MATRIX RETAINER.

Pat. Aug. 27, 1895.

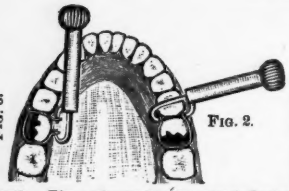


FIG. 3.

FIG. 2.

FIG. 1.

Fig. 1 shows Retainer. The hook or traveling arm is operated by bur at end of barrel. This retainer can be used upon the buccal, labial, lingual and palatine surfaces of the teeth. Fig. 2 shows band around first molar, drawn to place and held by retainer. Fig. 3 shows retainer in a different position.

PRICE, $3.00. Address

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Laboratory Work for Dentists.

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GOLD CROWNS.

Incisors, Cuspids and Bicuspids	$2.50
Molars	3.00
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Porcelain Faced Crowns	3.50

Materials included.

BRIDGE WORK.

Each Crown, Incisor, Cuspid or Bicuspid	$2.50
Each Crown Molar	3.00
Each Tooth between Crowns	$2.50 to 4.00
Gold Bands on Bridge, each	$1.50 and 2.00
Gold Crown, Plate Tooth attached	5.00

Materials included.

ALUMINUM.

Swedging	$3.00
Swedging and making Plate, 1 to 14 Teeth	5.00

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SEAMLESS GOLD CROWNS.

Bicuspids	$1.75
Molars	2.25

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Swedging Plate	$4.00
Swedging Plate with Rim	6.00
Soldering Teeth, each	1.00
Attaching Teeth with Vulcanite, each	.20
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1 to 3 Teeth	$1.50
4 to 7 Teeth	1.75
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Rubber included. Teeth extra.

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Teeth, Gold, etc., at actual cost.

Terms, CASH. Crowns made especially for each case. Send model and wire measurement of tooth or root. **Satisfaction guaranteed in all cases. Porcelain work of all kinds.**

Money Returned if Work is not Satisfactory.

Gold, Silver and Nickel-Plating done. A package of Annealed Copper Measuring Strips sent FREE on application.

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Morphia, Chloral, Carbolic or any drug which is in the least degree harmful to the most delicate child or adult. You will never have faint or sick patients, or toxic effects, even when used upon patients with heart trouble. UZANE is ENTIRELY HARMLESS under all conditions, ABSOLUTELY SAFE to employ in any quantity, and never fails to produce THOROUGH anesthesia. Why run the risk of an accident with that erratic drug, cocain, when you can extract all teeth (abscessed included) painlessly, and without endangering your patient's life, and your practice, with UZANE. UZANE will not deteriorate, but remain effective and thoroughly antiseptic for years.

A $7.00 Gold-Plated Hypodermic Syringe Free!

with your first $10.00 order (12 ounces) of UZANE. We are extremely anxious to have every dentist in the country make a fair and impartial trial of UZANE, knowing from past experience that when they are once familiar with its great value they will continue to use it. To attract your attention and give you an inducement which you can hardly fail to take advantage of, we have decided to practically sacrifice all the profits on the first order, and to offer you ABSOLUTELY FREE with the first $10.00 order of UZANE, a MAGNIFICENT GOLD-PLATED DENTAL SYRINGE. A revelation! Its equal has never been made. Metal throughout. Extra heavy finger rests. Possessing every improvement of an up-to-date syringe. Enclosed in a handsome leather case, together with two needles.

NO FREE SAMPLES

A trial ounce, together with handsome cut of the Syringe, and testimonials, mailed you upon receipt of 75c.

CASH MUST ACCOMPANY ALL ORDERS

PRICE

2 ozs., $2.00 6 ozs., $5.00
12 ozs., $10.00
(Including gold-plated syringe.)

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Barker's Case Heater, Soldering and Melting Furnace.

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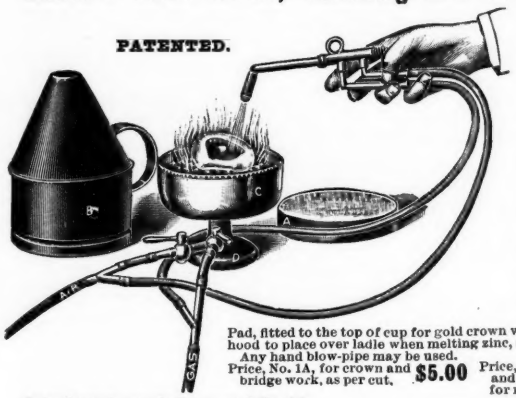

By the use of this furnace an investment can be dried out and a crown soldered in from three to five minutes from the time the investment is hard enough to handle, without any liability of checking the porcelain. This device consists of a revolving iron cup with fire proof lining, and filled with pieces of broken pumice to pack the investment in. A forced blast of gas enters at the bottom, the pressure being governed by the gas and air valves, thereby securing a more intense and evenly distributed heat beneath and around the sides of the investment; thus there is no checking of the porcelain or warping of the bridge or plate.

Fig. A is an Asbestos Pad, fitted to the top of cup for gold crown work, etc. Fig. B, Sheet-iron hood to place over ladle when melting zinc, etc.

Any hand blow-pipe may be used.

Price, No. 1A, for crown and bridge work, as per cut, **$5.00**

Price, No. 2B, for crown and bridge work, also for melting metals, **$8.00**

Order through your dealer, or send direct to

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This is to certify that I have examined and experimented with the Barker Soldering Block, and find it very satisfactory in every way. Very truly yours, [Feb. 20, '97] S. H. GUILFORD, Dean.

DR. J. TENNEY BARKER:

Pittsfield, Feb. 17, 1897.

Dear Doctor: I have used your Soldering Furnace for several months for all classes of crown and bridge work, and really I don't see how I ever got along without it. It heats the case through from the under side, so when I put in the solder and apply the blow-pipe it flows like melted wax into every part. I am glad to give you my testimonial. Very truly yours, SIDNEY S. STOWELL, D.D.S.

New Haven, Conn., March 11, 1897.

Dear Dr. Barker: You ask my opinion of your Heater. After a very brief trial, I am pleased to say it does its work perfectly; by its use I look for no more broken porcelain, besides doing the work in less than half the time of any other method. I predict a very large sale for it. You have my best wishes.

Very truly yours, E. S. GAYLORD.

CHEAP Gold Crowns CHEAP Bridge Work

And in fact all kinds of cheap dentistry are a snare. Why not have the **BEST** and thereby insure the use of the finest material and workmanship? A nicely fitted crown or a good bridge is a grand advertisement for you. We can and will do this for you if you will let us. A handsome and natural crown with solid cusps or a combination of gold and porcelain.

Send us a well defined model with bite and wire size and we
GUARANTEE SATISFACTION.

If you insist on having cheap work at cheap prices you will get it just the same as the patient who insists on the same thing; but the **BEST IS THE CHEAPEST** in the end. Sample cases supplied and cavities drilled in porcelain teeth. All orders by mail or express receive prompt and careful attention.

Incisors $2.00. Molars $2.25.

Send for complete prices or estimates before ordering elsewhere.

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Welch's Alloy, 1 oz., $3.00; 2 ozs., $5.50; 4 ozs., $10.00; 10 ozs., $22.50
Welch's Amalgam, 1 oz., 2.00; 2 ozs., 3.75; 4 ozs., 7.00; 10 ozs., 15.00
Welch's Oxiphosphate, large, $1.50; medium, $1.00.
Liquids or Powders, large, $0.75; medium, 50 cents.

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A new device for quickly and thoroughly cleaning and sterilizing dental instruments. Every prudent, wide-awake dentist will have one. It saves his instruments; it prevents the transmission of disease germs from one patient to another; it helps his business; it is simple; it is handy; it is a good advertisement.

For circulars and prices, address the manufacturers.

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For the instantaneous, safe and easy extraction of **ANY** tooth. Attaches to an ordinary dental forceps. Requires no special practice, **NO TUG AND PULL.** Simply apply the forceps to the tooth in the usual way and **PRESS ON THE FULCRUM.** Warranted absolutely safe and surprisingly **EASY** to both patient and operator. **PRICE FIVE DOLLARS,** transportation prepaid. Money back if not all and more than claimed.

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For Extracting Live Pulp it has no Equal.

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Contains less than one per cent Cocain,

Less than one-fifth of one per cent Phenol,

Combined with well-known Antiseptics,

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Order of your dealer. If he can't or won't supply you, I will send it, *postpaid*, to any part of the United States or Canada, on receipt of price, **$1.50 per 2-ounce bottle.**

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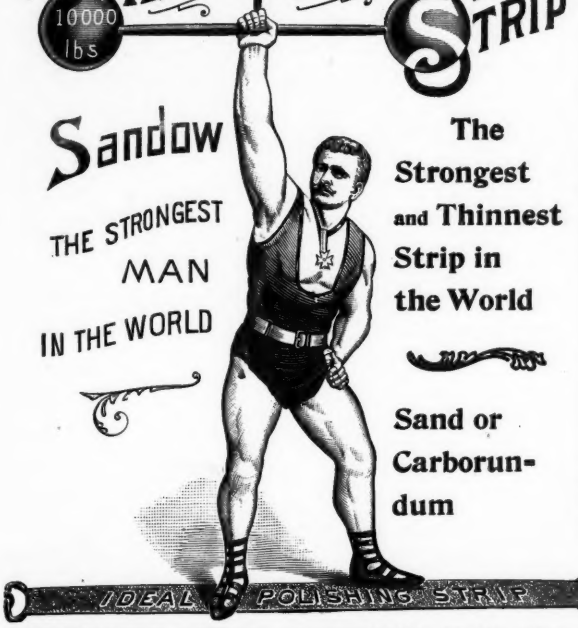

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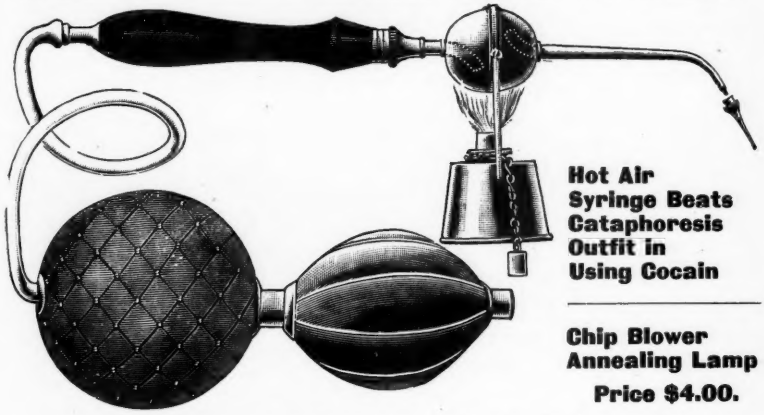

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Chip Blower Annealing Lamp

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BEST	BEST	BEST
TEETH	**RUBBER**	**AMALGAM**
$1.00 PER SET	**$2.00 PER POUND**	**$1.50 PER OUNCE**

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Our rubbers are known for their great strength, elasticity, and ease and beauty of finish, making light, beautiful dentures.

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Send us your old Gold, Silver, or Platina Scrap. We pay big prices for it in exchange for Teeth.

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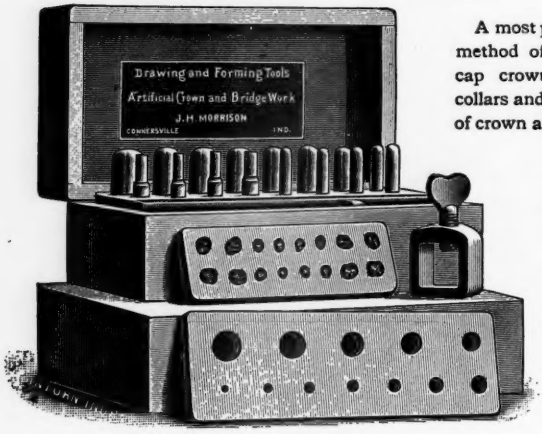

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Aluminum, gold, or any metal may be used.

A Seamless Contour Crown for any molar or bicuspid can be made by any one of ordinary skill in

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May be ordered of any dental depot, or of the Manufacturer,

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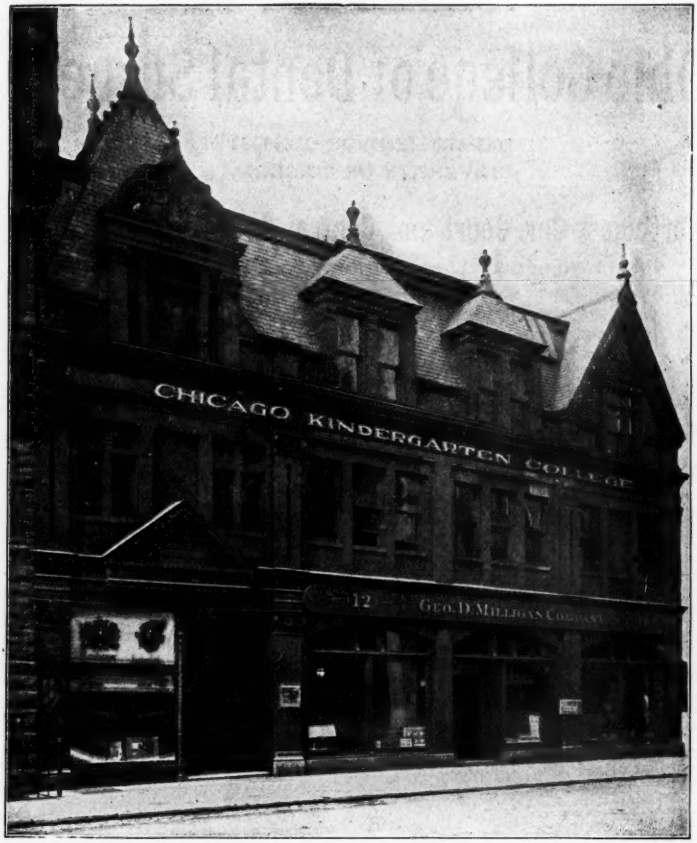

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DENTAL DEPARTMENT
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DEPARTMENT OF DENTISTRY
UNIVERSITY OF CINCINNATI.

Northwest Cor. Court and Central Ave., Cincinnati, Ohio.

The 52d Winter Session begins October 5th, 1897, and closes April 5th, 1898.
A Spring Course of Clinical Instruction begins April 12th, 1898.
A Fall Course of Clinical Instruction begins September 1st, 1898.

FEES.

Matriculation Fee (payable but once), -	$ 5.00
Professors' Tickets for each year (including all clinical and laboratory courses), - -	100.00
Graduation Fee, - - - -	25.00

For further information and announcements, address,

H. A. SMITH, D. D. S., Dean, or
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The Best Dental

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THIS JOURNAL

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The Baltimore College of Dental Surgery, the first and for many years the only Dental School, offers facilities for the study of Dentistry proper, such as age and experience only can give. Its immense *museum*, complete apparatus, large and well-arranged building, and carefully-studied *curriculum* give to its students great advantages and opportunities, both theoretical and practical, while its age gives its Diploma a dignity far outranking all other colleges—a Diploma honorably represented in all civilized countries and held by the most distinguished members of the Dental Profession.

The fact that Dentistry must be *practically taught* is fully recognized, *the College Infirmary*, a most complete, large and handsome *Hall*, being daily filled with clean and respectable patients, of a class nearly equal to those of the average dentist. *This Infirmary is open all the year*, students paying an entrance fee which is deducted from those of the regular succeeding course.

The session begins October 1, closing in April. A large corps of Demonstrators, always present, put in actual practice the teachings of all lectures on Dentistry—leaving nothing undemonstrated. *All methods are fully taught*, all appliances and apparatus used; the making of instruments and the most elaborate gold and continuous-gum work, and all the cases arising in ordinary practice, with many which are rarely seen, carefully demonstrated.

Commencing October 1, 1895, this College will admit women as students, subject to the same requirements as men.

The College has formed an alliance with the College of Physicians and Surgeons, by which its students are privileged to attend all lectures and clinics. The patients of this medical school numbered last year over 40,000.

Graduates of the Baltimore College of Dental Surgery are required to attend but *two sessions* at the College of Physicians and Surgeons prior to presenting themselves as candidates for the degree of M. D. (See catalogue.) In accordance with the resolution adopted by the National Association of Dental Faculties in the City of New York on the 4th of August, 1884, and which went into effect for the session of 1885 and 1886, the qualifications for entering the Junior Class are a preliminary examination in the ordinary English branches.

TERMS OF GRADUATION.—Attendance on three Winter Courses of lectures in this College. As equivalent to one of these we accept *one course* in any reputable Dental College. *Graduates in Medicine* can enter the Junior Class.

BENEFICIARY STUDENTS.—Each State Dental Society is privileged to send one Beneficiary Student to this College at one-half the regular tuition fees. This has been for some years an established feature of this College.

FEES.—Matriculation (paid once only), **$5.00.** Tuition fees, **$100.00.** Diploma fee, **$30.00.** Dissecting fee, **$10.00.**

Students corresponding with the Dean will please be careful to give full address, and direct their letters to

M. W. FOSTER, M. D., D. D. S., Dean, No. 9 W. Franklin St., Baltimore, Md.

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BIRMINGHAM, ALA.

SESSION 1897-98.

The regular Winter Session will begin the first Tuesday in October, 1897, and continue until April, 1898.

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FIFTH ANNUAL SESSION 1897-98.

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ELMER DE WITT BROTHERS, B.S., LL.B., Counsel,
Professor of Dental Jurisprudence.
WM. L. BALLENGER, M.D., Professor of Histology and Bacteriology.
OSCAR DODD, M.D., Professor of Pathology and Anesthesia.
FRANK N. BROWN, D.D.S., Professor of Prosthetic Dentistry.
J. A. MCKINLEY, M.D., Professor of Anatomy and Physiology.
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Professor of Organic Chemistry and Director of Chemical Laboratory.
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C. M. ROBERTS, D.D.S., Demonstrator Prosthetic Dentistry.
CHARLES LUND, Assistant Demonstrator.
FRANK M. KINDIG, M.D., Demonstrator of Anatomy.
G. WALTER GRAY, D.D.S., Assistant to the Chair of Orthodontia.

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FRANK H. STAFFORD, D.D.S.

PRELIMINARY COURSE.

For one month prior to the regular opening of the College a preliminary Course will be held. This course is recommended to all who expect to attend the regular session; especially those who have had no experience in dentistry will find this course greatly to their advantage. A fee of $20.00 will be charged for this course, which will be deducted from the regular college fees for the ensuing year. Those who cannot take the entire preliminary course should come in as early as possible.

REGULAR SESSION

will commence Sept. 28th and continue until April 5th, which will be immediately followed by a

PRACTITIONERS COURSE

which will continue for 12 weeks (or till June 19th). A Practitioners Course is also given during the month of September.

Women are admitted into this college on the same terms which govern the admission of men.

COLLEGE FEES.

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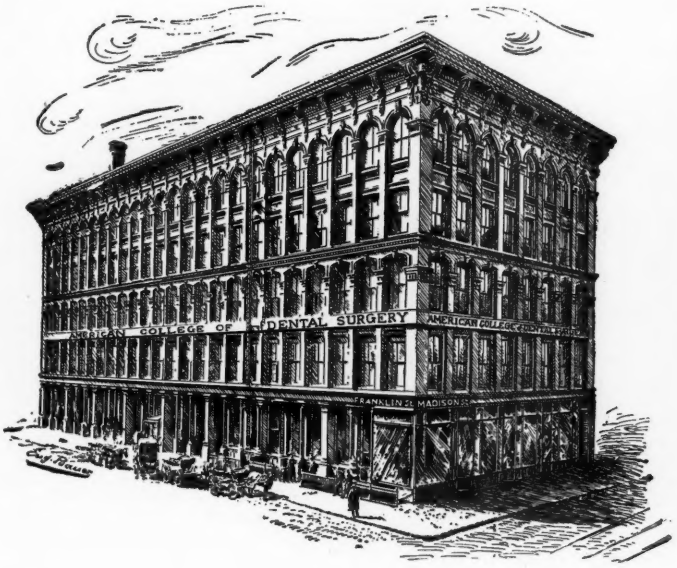

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Three full winter courses of lectures are required before graduation. Graduates of pharmaceutical and undergraduates of medical colleges in good standing and graduates of reputable veterinary colleges are admitted to the second year course, and can become candidates for graduation after taking two full winter courses of instruction.

TOPICAL STATEMENT OF WORK.

FIRST YEAR.

During the Freshman year the studies taken up are: Theoretical and Practical Chemistry, Anatomy, Physiology, Materia Medica, Dental Anatomy, Histology, Operative and Prosthetic Technics and Operative and Prosthetic Dentistry.

Recitations in this course are conducted daily in commodious rooms specially arranged for this method of teaching. Stated lessons assigned from approved text-books supplement the didactic lectures and work in the laboratories.

SECOND YEAR.

During the Junior year students complete the work in Anatomy, Physiology, Chemistry, Histology, Pathology and Bacteriology and Materia Medica. In addition to this they receive instruction in Comparative Dental Anatomy, Crown and Bridge Work, Regulating Appliances, Splints and all kinds of Plate Work, and operate in the Infirmary.

THIRD YEAR.

During the Senior year the students listen to lectures on Oral Surgery, Therapeutics, Operative Dentistry, Dental Anatomy and Pathology, Orthodontia and attend Clinics. In addition to the lectures each student is required to operate in the Infirmary and perform practical work in the Laboratory.

Fees good until April 1st, 1898.

FRESHMAN YEAR, 1897-98.

Matriculation Fee,	**$ 5.00**
General Ticket,	**100.00**
Histological Laboratory Ticket,	**5.00**
Dissection Fee (one part),	**10.00**
	$120.00

JUNIOR YEAR, 1897-98.

Matriculation Fee,	**$ 5.00**
General Ticket,	**100.00**
	$105.00

SENIOR YEAR, 1897-98.

Matriculation Fee,	**$ 5.00**
General Ticket,	**100.00**
	$105.00

A fee of $5 00 must be deposited to cover chemicals and breakage in the Chemical Laboratory.

FEES FOR THE ANNUAL SPRING AND SUMMER COURSE.

Students will be admitted to this course upon payment of the matriculation fee and $20.00. Those who attend only one month will be required to pay the matriculation fee and $10.00. The amount paid during the spring and summer course will be deducted from the fees of the following winter session.

The Practitioner's Course will consist entirely of practical work. Those who wish to may take up this work during the spring and summer months.

Instruments and appliances for clinical department will cost from $25.00 to $40.00.

Board, including light and fuel, can be obtained at a convenient distance from the College at from $2.50 to $4.00 per week.

Graduates of the College are requested to notify the Dean of changes in their residence.

Letters of inquiry should be addressed to

DR. TRUMAN W. BROPHY, Dean,
126 State Street, Chicago, Ill.

Chicago College of Dental Surgery

DENTAL DEPARTMENT OF LAKE FOREST UNIVERSITY.

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The lot on which the building stands has a frontage of eighty-five feet, and a depth of one hundred and twenty feet. It is a five-story and basement structure, the basement and first story being of rock-faced Bedford stone, and the superstructure of pressed brick and terra-cotta, with terra-cotta trimmings.

The building has three entrances, the main one through a large cut-stone doorway surmounted by a stone arch beautifully ornamented with carved work. The interior is finished in hard wood, according to latest idea of elegance, convenience and comfort.

The entire six floors of the building are divided into lecture rooms, class rooms, clinic rooms, etc. with the exception of the second floor, which is devoted to the Dental Infirmary. The chief lecture room has a seating capacity for four hundred and fifty students. There is also a dissecting room, thoroughly equipped with all the requisites for the study of human anatomy.

There are Histological, Chemical, Bacteriological Laboratories, also Laboratories for the study of Operative and Prosthetic Technics, and one for the construction of artificial dentures.

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FORTY-SECOND ANNUAL SESSION, 1897-98.

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OSCAR T. WAYNE, D.D.S., Demonstrator of Operative Dentistry.
JOHN A. MORAN, D.D.S., Demonstrator of Operative Dentistry.
A. GRANT LODER, M.D., Assistant Demonstrator of Anatomy.
E. A. KRETSCHMAN, Instructor in Modeling.

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This College has accepted the requirements of the National Association of Dental Faculties with regard to admission and graduation of students. (See announcement for 1897-98, which can be procured from the Dean.)

The Spring and Fall Sessions.

THE SPRING COURSE commences on the second Monday in April and continues until June 20. Fee, $50, which will be credited upon the fee for the regular session.

THE FALL COURSE will commence on September 6, and continue until the 1st of October, and will be free to those who matriculate for the regular session.

Attendance upon the Spring and Fall Courses will be deemed equivalent to the term of pupilage under a private preceptor.

The Regular Session

Will commence on October 1, 1897, and continue until the 6th of April ensuing. Twenty lectures will be delivered each week on the various branches taught.

Clinical Practice.

Lecture hours excepted, general clinical practice is available for the student continuously through the day. Competent instructors are always present.

Graduation in Medicine.

By an arrangement with Jefferson Medical College, such students as may desire to do so can, if found qualified, obtain the two degrees, in Dentistry and Medicine, in five years. Students desiring to graduate in medicine are required to notify the Dean of their intention at the beginning of their second course.

FEES.

Matriculation (paid but once)	$ 5.00
For each Year (Demonstrator's Ticket included)	100.00
Dissecting Fee	10.00
Diploma Fee	30.00

Board can be obtained at from $4.00 to $6.00 per week.

The Instruments and Tools required can be procured for from $35.00 to $45.00. This sum does not include the price of Dental engine.

For further information, address

C. N. PEIRCE, D.D.S., Dean, 1415 Walnut St., Philadelphia.

NEW YORK COLLEGE OF DENTISTRY

INCORPORATED BY THE LEGISLATURE OF THE
STATE OF NEW YORK IN 1865.

THIRTY-SECOND COLLEGIATE YEAR

The collegiate year work of 1897-98 will consist of Infirmary practice from June 4, 1897, to June 2, 1898, and a lecture session of eight months, from October 4, 1897, to June 2, 1898.

Registration for the Lecture Session of 1897-98 closes October 14, 1897.

Applicants will be admitted to the lecture session of 1897-98 as DEGREE SPECIAL or SESSION STUDENTS.

1. **DEGREE STUDENTS**—Those who matriculate toward the degree of the College having the admission preliminary education for the degree of D.D.S. required by the New York State law:

(*a*) No admission preliminary education required of those graduating in 1898 or 1899, who were matriculated in a registered dental college prior to January 1, 1896. They are also admitted without restriction to the license examination of the State of New York.

(*b*) Those graduating in 1899 or 1900, who were matriculated in a registered dental college between January 1, 1896, and January 1, 1897, have to have twenty-four academic counts or their equivalent, or have to secure the same; for those graduating in 1899, before October 1, 1897; for those graduating in 1900, before October 1, 1898.

(*c*) All matriculating after January 1, 1897, having credentials of having had a preliminary education equivalent to the academic diploma of a High School or Academy of the State of New York.

2. **SPECIAL STUDENTS**—Those who, without the admission preliminary education of either 1896 or 1897, matriculate, but not toward the degree, attend the college **free of charge,** pending the securing of the required admission preliminary education and with their Special Student period credited as pupillage only. Their studies toward the degree will commence on the date that they are entitled to matriculate as Degree Students.

3. **SESSION STUDENTS**—Those who, without the admission preliminary education, matriculate, but not toward the degree, and pay the fees of the session. They are eligible to the examinations and the certificate of the session; said certificate will admit them to advanced standing in all dental colleges belonging to the National Association of Dental Faculties.

A graduate of a dental college out of the State of New York is not admitted to the dental license examination of the State of New York unless he has fulfilled the admission preliminary education requirements of "Degree Students" as stated above.

For further information send for an announcement of 1897-98 and a copy of "Form I" of the College, addressing

Faneuil D. Weisse, M.D., Dean
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¼-ounce	**15.00**	
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2 ounces at one time	**28.00**	per ounce.
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Light Orange, Light Red, Dark Red, Maroon, etc., per lb.	$2.50
Weighted Rubber, per lb.	3.50
Pink (superior quality), per lb. . .	4.50

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